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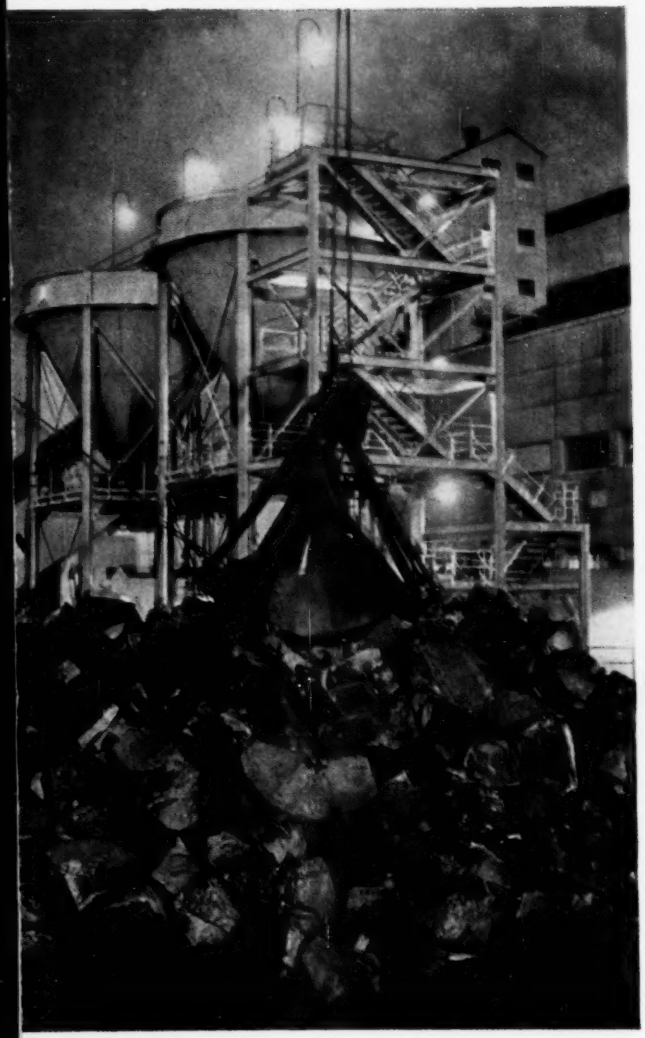
Chemical Week



Silver lining for aluminum: big new demand shaping up in autos, construction . p. 21

Ritchie rides again. Beleaguered AD-X2 maker sees $6 million sales in '59 . . p. 31

Afraid of hydrogen cyanide? Small company teaches workers to use it safely . . . p. 47

Now a chemicals producer. Organometals manufacture starts at Electromet . . p. 77

English-reading computer needs no programing expert. Gain: time and money . p. 82

November 22, 1958

STEVENS RICE
UNIVERSITY MICROFILMS IN
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Famous escape artist meets his match

YOU KNOW synthetic rubber—in the products you use—for its healthy bounce, its stretch, or its spring. But the bales of uncured rubber with which industry works are another story.

Subject to a condition called "cold flow," during storage and shipment, the uncured product once was known as an incurable escape artist. It flowed, settled and burst from ordinary packages. Escaped rubber stuck to bits of cardboard, dirt and paper. Once contaminated, it was difficult to process into quality products.

Shell Chemical has solved this problem—by caging uncured synthetic rubber in a unique package called the Flotainer*. Completely new in principle, Flotainer keeps rubber in check, prevents contamination, reduces waste, speeds handling and saves storage space.

The Flotainer is another way Shell's creative engineering cuts costs for both industry and the consumer.

*If you are interested in a complete description of the Flotainer package, we will be glad to send an illustrated bulletin.
"*Flotainer*" is a Shell Chemical Trademark.

SHELL

Shell Chemical Corporation

Chemical Partner of Industry and Agriculture

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TITANIUM PIGMENT CORPORATION

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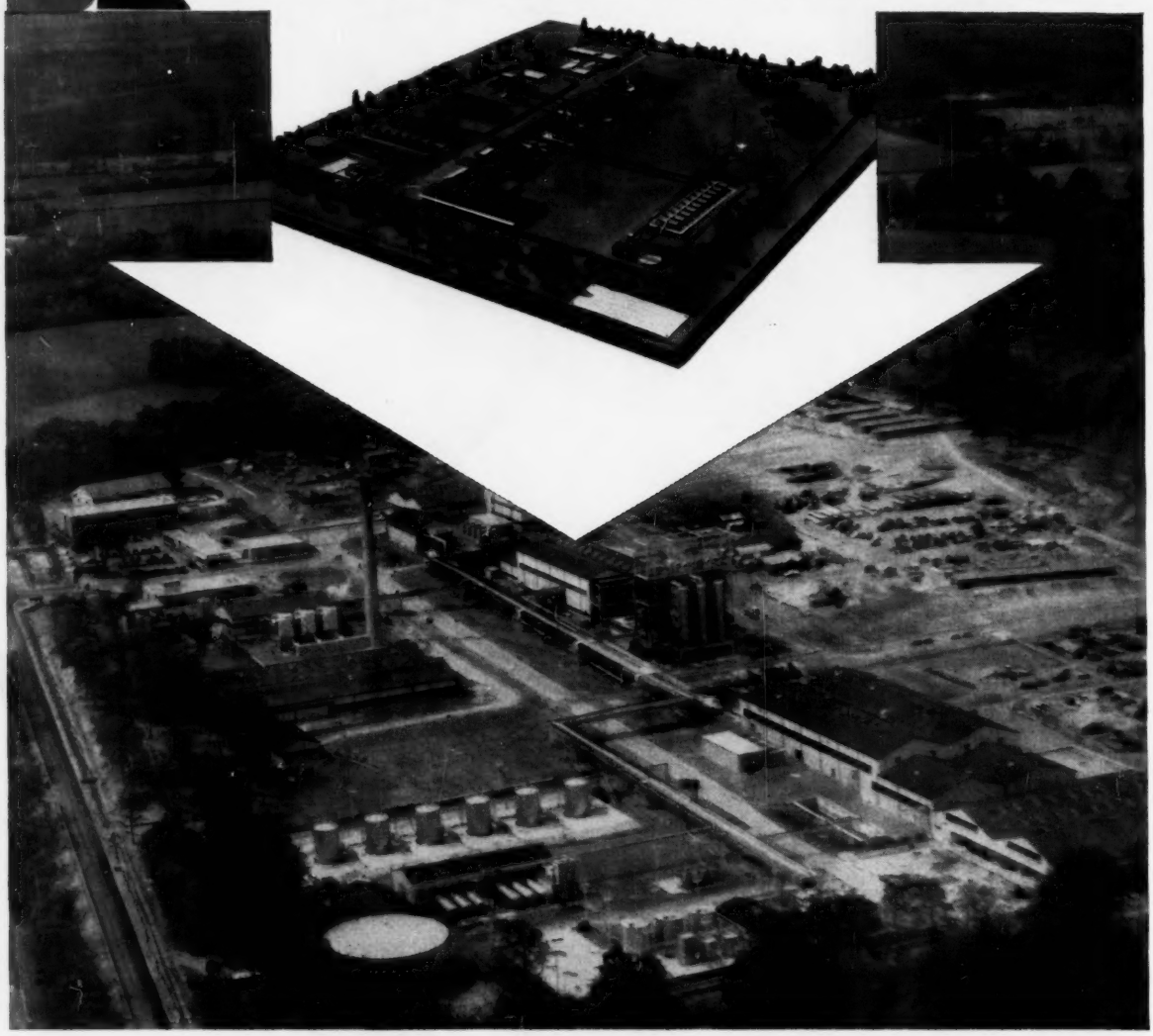
*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation.

5731-A

A plan from Pittsburgh becomes a plant in Britain as Blaw-Knox completes construction of a synthetic rubber plant for International Synthetic Rubber Company, Ltd.



Integrated engineering construction goes global as Britain gets its first large scale synthetic rubber plant

In designing and building this major facility, Blaw-Knox combined the talents and resources of two nations. Preliminary engineering was done in Pittsburgh. Then, in Britain, definitive construction drawings were made, equipment purchased, and construction begun. Now complete, the new plant marks Britain's first entry into this vital industry.

"Firsts" are frequent with Blaw-Knox, whose synthetic rubber pioneering ranges from building prototype plants during War II to the engineering design of Japan's first synthetic rubber plant.

For details on these and other activities in the processing industries, contact Blaw-Knox Company, Chemical Plants Division, with headquarters in Pittsburgh. Branch offices in New York, Chicago, Haddon Heights, New Jersey, Birmingham, Washington, D.C. and San Francisco.

for plants of distinction . . . BLAW-KNOX

Chemical Week

TOP OF THE WEEK **NOVEMBER 22, 1958**

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COVER PICTURE COURTESY OF UNION CARBIDE CORP.

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Will liquid fluorine launch American satellites bigger than "Sputniks"?

"Yes!" says major aircraft company in rocket development program. Calls use of liquid fluorine in new rocket engine "last major breakthrough in chemically fueled rockets"!

Rocket engineers have long known that elemental fluorine held promise of vastly increased thrust for rockets. The problem was to "tame" this terrifically reactive chemical.

As the leading producer of fluorine, General Chemical solved the problem of availability. It created the only privately owned liquid fluorine facilities in the country and developed the method for shipping fluorine as a liquid in "thermos bottle" trailer trucks. This made fluorine available in bulk quantities for the first time . . . enabled government and industry rocket researchers to expand and intensify development work with this "optimum" oxidizer.

Now the use of fluorine as a high energy propellant is close at hand. Experts forecast that it will enable this country to accomplish difficult space missions, including the launching of satellites substantially larger than the ton-plus "Sputniks."

First in fluorine chemistry

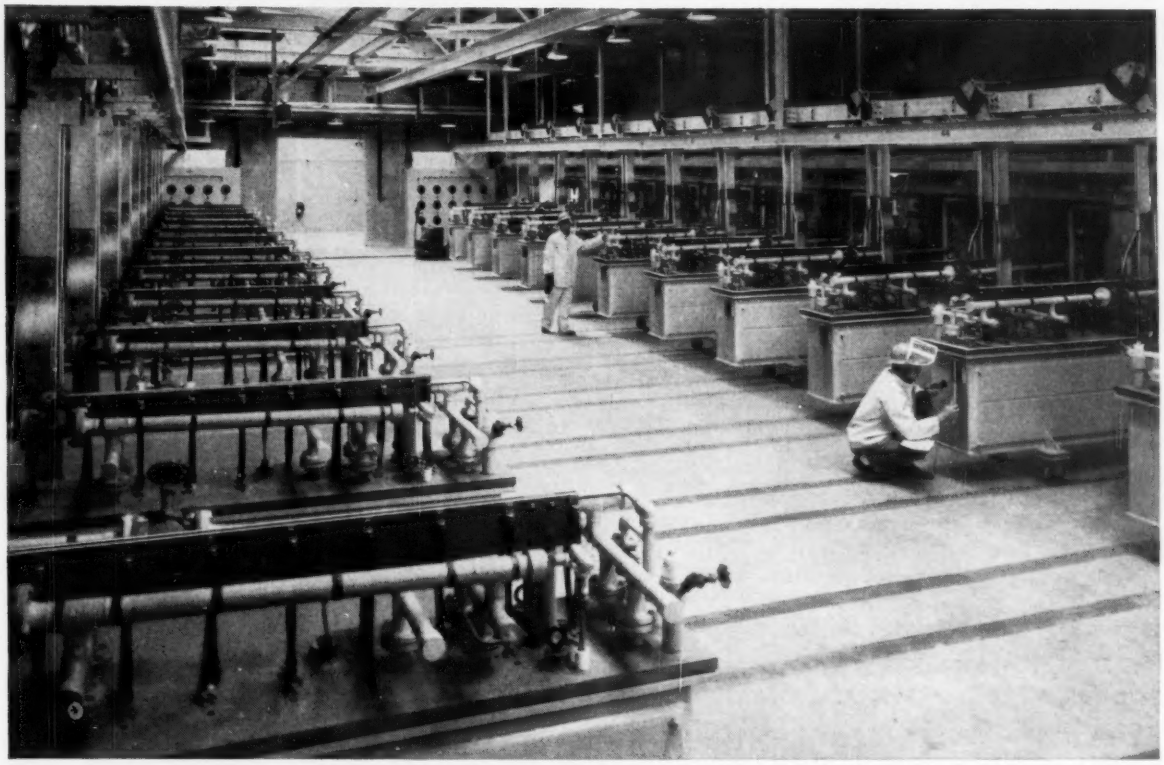
Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

General Chemical now shipping liquid fluorine from extensive new facilities at Metropolis, Illinois

General Chemical is the *sole* supplier of liquid fluorine for America's rocket and missiles program. Tonnage shipments have been made regularly for several years to rocket research centers in various parts of the country from our Baton Rouge, Louisiana, Works. Now they are also going out from extensive new facilities in full scale production at Metropolis, Illinois.

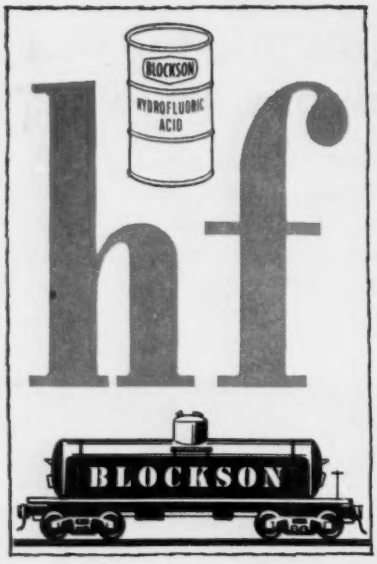
While most of the fluorine produced at Metropolis will be used to make uranium hexafluoride under an A.E.C. contract, there is sufficient capacity at the plant to supply tonnage quantities of liquid fluorine for the missile development program.



INTERIOR VIEW of General Chemical's new fluorine plant at Metropolis, Ill. Now in full scale production of liquid fluorine, the plant is making tank truck shipments of this high energy oxidizer to rocket research centers working on advanced rocketry programs.

"THERMOS BOTTLE" TANK TRAILERS developed by General Chemical research made possible the shipping and handling of fluorine as a liquid in bulk.

GENERAL'S NEW PLANT AT METROPOLIS, ILL., is scheduled to produce uranium hexafluoride for the Atomic Energy Commission early in 1959. Its fluorine facilities are already in operation.



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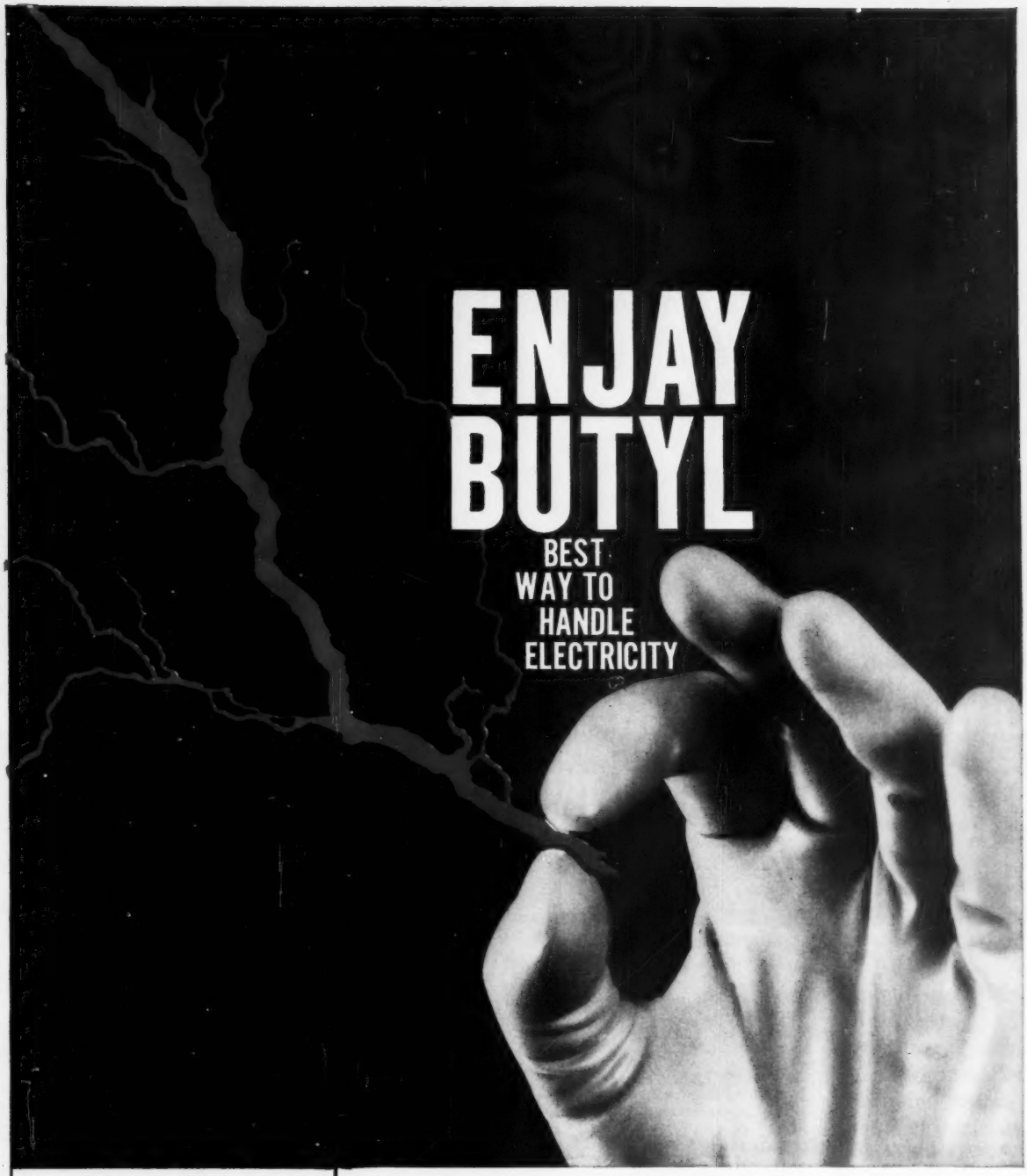

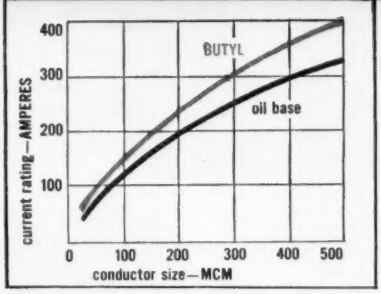

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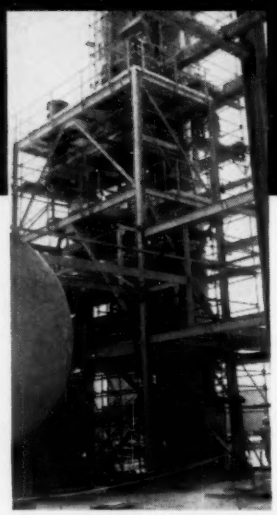
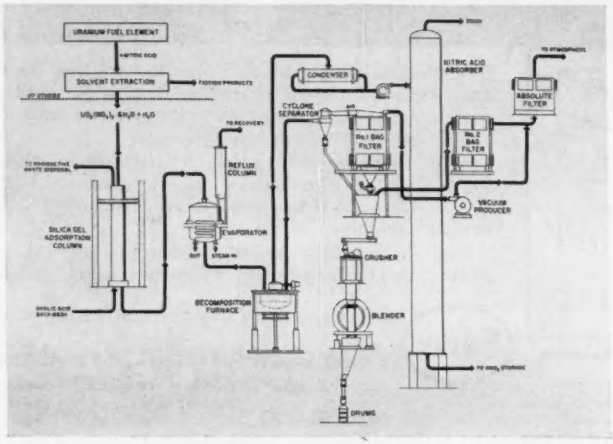


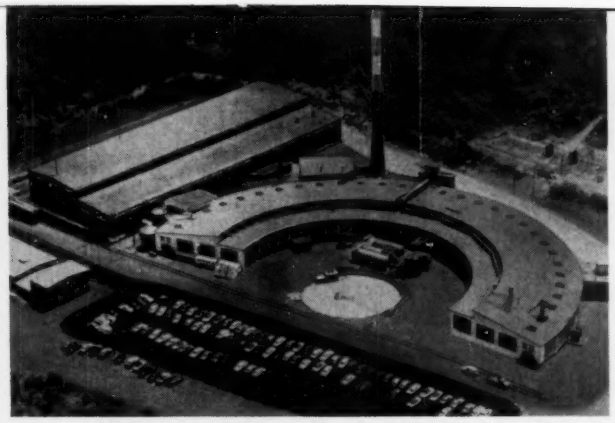
Nitric Acid Recovery Unit of the Savannah River Plant Chemical Separations Plant. Lummus handled design, engineering, procurement and construction liaison of this unit.

Heavy Water Area, Savannah River Plant. Lummus handled design, engineering, procurement and construction liaison of this area.

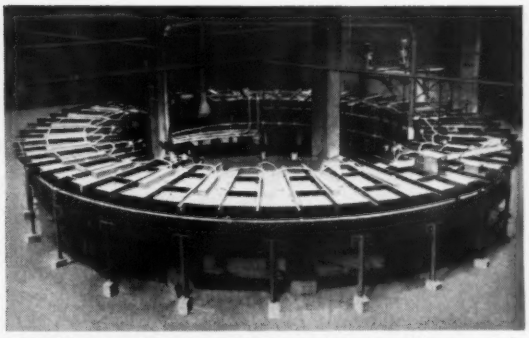
World-wide designers, engineers and constructors of over 800 major plants for the process industries in the last half century, Lummus now offers its experience for the development of atomic energy installations. Here are some current examples of Lummus work in this field:

Uranium Oxide Recovery Unit of the Savannah River Plant. Lummus handled design, engineering, procurement and construction liaison of this unit.



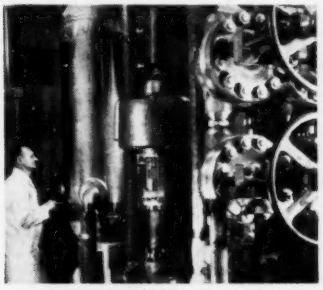


Plant engineered and designed by Lummus for Beryllium Corporation to extract beryllium metal from beryl ore.

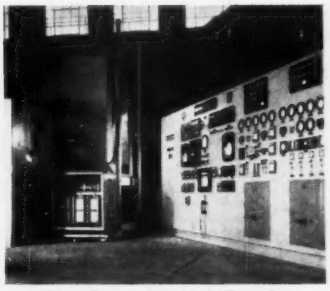


Ore sintering furnace used to produce beryllium metal.

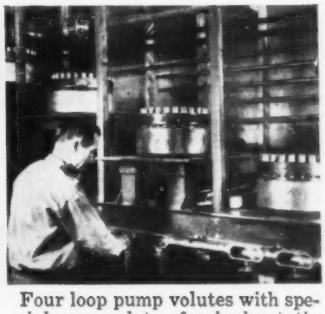
Below is the high pressure, high temperature test facility, constructed by Lummus at its Engineering Development Center for the Knolls Atomic Power Laboratory. The facility consists essentially of a pressurized water heat exchange system and demineralizing equipment. Reactor fuel and materials samples are inserted in the in-pile test section for study under controlled conditions of temperatures, pressure, radiation flux, and water conditions.



Pressurizer, main flow control valve, loop block valves.

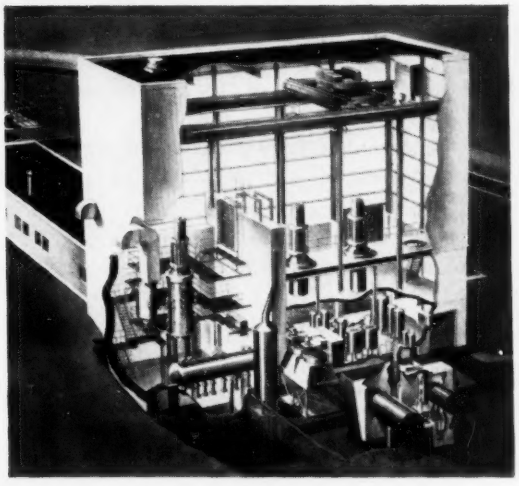


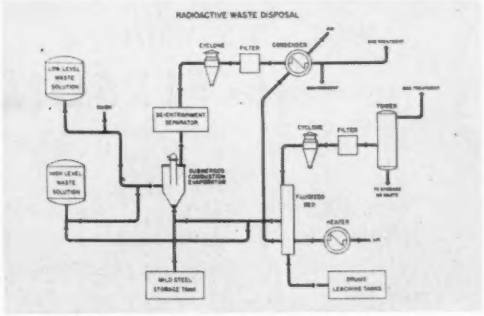
Test Loop Control Panel.



Four loop pump volutes with special cover plates for hydrostatic testing.

This high temperature test facility was designed and engineered by The Lummus Company under sub-contract to Westinghouse Electric Corporation, Bettis Atomic Power Division. Its purpose is to make criticality measurements and to determine flux distributions in water moderated reactors operating at low power levels and elevated temperatures and pressures.





In the not too distant future, large volumes of radio-active wastes will be forthcoming from power reactor operations. Great quantities of this material are now being stored in costly underground tankage. We believe that it would further reactor development to have a more economical and safe waste disposal system to take care of the large radio-active waste volumes. The Lummus approach to this has been directed toward utilizing known engineering techniques which require special consideration due to the unique problems associated with radio-active waste.

Lummus' extensive experience in evaporation, entrainment, condensation, fluidization, material handling and other unit operations, is available to design and engineer radio-active waste disposal systems of the type shown here.

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Triethanolamine is used to make lauryl sulfate salt which is an active ingredient in some of the liquid shampoos.

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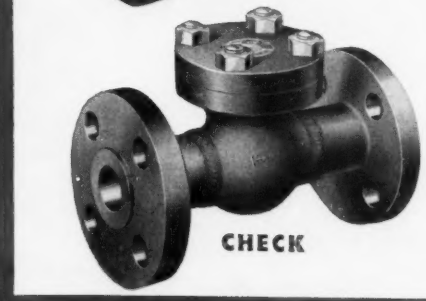

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OL' MAN RIVER SEES NEW CAUSTIC SODA PLANT GO 'ON STREAM'

Multimillion dollar plant at Plaquemine, La., meets growing need of Middle South industry for top quality caustic soda.

Gone are the days when the lower Mississippi eased quietly toward the Gulf through sleepy bayou country. Industrial giants have awakened the Evangeline country to a bustling new era of productive growth. And to keep pace with the seven league strides of textile, paper, aluminum and oil processors, Dow has established a new giant on the placid Mississippi banks to supply the expanding need for vital caustic soda.

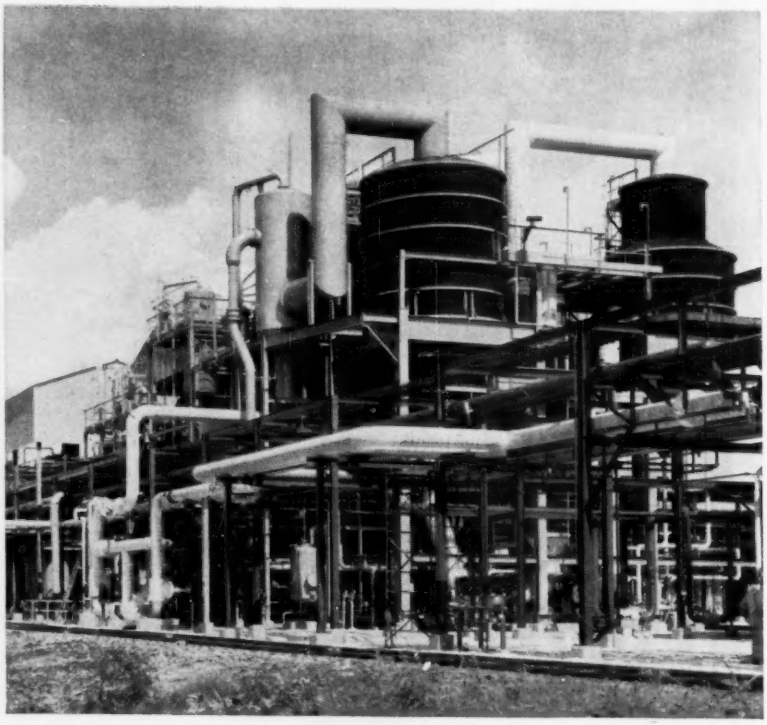
In October, Dow's ultramodern caustic soda plant at Plaquemine, Louisiana, started production. Using the most modern equipment, this multimillion dollar plant now turns out top quality caustic in both 50% and 73% solution.

Oil producers, aluminum processors, pulp and paper mills, textile plants and other users will benefit from the nearby location of this new source of caustic soda.

"Shipping facilities are superb," a Dow spokesman said. "The plant site on the Mississippi River, some ten miles south of Baton Rouge, adds the advantage of water transportation to excellent highway and rail facilities, giving our customers the widest possible range of shipping methods."

The addition of the Plaquemine plant brings the number of Dow caustic producing centers to five. These five producing points (Michigan, Texas, California, Louisiana, and Ontario), supplemented by eight bulk-storage shipping terminals, assure users fast delivery and dependable supply regardless of their plant location.

"This Plaquemine plant is also hard-cash evidence of Dow's faith in the industrial future of the Middle South," a Dow official said when the plant was completed. "And it's proof of our belief in the inexorable expansion of the total American economy. Dow is building today for the needs of tomorrow's customers."



SOLUTION, SOLID OR FLAKE . . .

A single, dependable source for all forms of caustic

A tank car of caustic soda solution pulls in on a textile mill's siding. A semi-trailer loaded with drums containing caustic flake backs up to the loading dock of a paper mill. A chemical formulator unloads a carload of ground caustic flake.

On any day, across the country, you'll find caustic users like these, with varying needs, filling their requirements from the same source—Dow. A basic producer of caustic soda, Dow provides this vital chemical in all forms: *50% solution*, for maximum handling economy; *73% solution*, most economical form for large consumers; *solid caustic soda*, preferred by some users far from producing points; *flake*, for users who require 400 pounds or less at a time; *¼" flake*, an intermediate particle size for formulating and compounding, and *ground flake*, for more effective compounding with other materials.

A fleet of specially designed tank cars for caustic solution and new full open-head drums for dry forms assure Dow customers satisfactory shipments every time.

The 86-page Dow Caustic Soda Handbook, available by writing, tells the complete caustic soda story.

SODA ASH . . .

Dow's Texas hopper serves the South

The South's chemical, textile and paper industries have a mighty big appetite for soda ash. And they're always fed on time from the unfailing reserves at Dow's Freeport, Texas, plant.

A textile mill production manager who uses soda ash combined with caustic soda for scouring and bleaching explained that he orders light soda ash from Dow because he can order caustic at the same time and get it delivered in the same truck, saving on both shipping and handling.

Light soda ash (58%) is produced at the Freeport plant for many industrial uses such as the paper industry's sulfite process and the preparation of such commercially valuable chemicals as phosphates, polyphosphates, sodium silicate, sodium chromate, sodium thiosulfate and certain boron compounds.

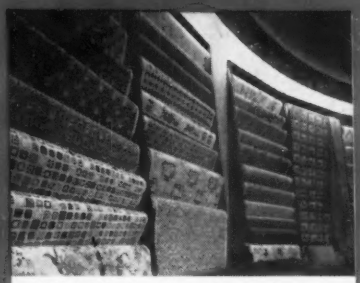
Dow's Soda Ash Book provides users with a complete manual of the uses, properties and methods for analysis of soda ash. Copies are available by writing to Dow.

★ ★ ★ ★

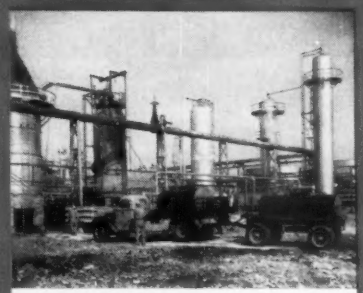
For further information on any of the alkalies and applications mentioned in this ad, write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Chemicals Sales Department 414B.

PROFITABLE FIELDS FOR DOW CAUSTIC SODA

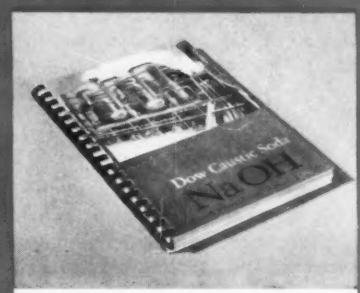
PAPER—Caustic soda is primary ingredient for de-inking and pulping waste paper. Also used for soda pulp process treatment of hardwood chips.



TEXTILES—Caustic soda is the most economical alkali treatment to accomplish swelling in mercerizing process.



PETROLEUM—Effective in removing phenols and other acids in crude processing, and for removing sulfur compounds from naphthas.



CAUSTIC SODA BOOK—Caustic soda properties, uses, forms, shipping and handling data and methods of analysis. Write for copy.

DOW CHEMICALS basic to the chemical processing industry

Alkylene Oxides, Glycols • Industrial Preservatives • Polyalkylene Glycols • Glycol Ethers • Alkalies • Phenolic Compounds • Brominated and Chlorinated Aliphatic Compounds • Inorganic Acids • Halogens • Organic Acids and Esters • Inorganic Chlorides, Bromides and Bromates • Nitrogen Compounds • Amino Acids • Glycerine Salicylates • Phenyl Phosphates • Heat-Transfer Media • Flotation and Flocculating Agents • Chelating Agents Ion Exchange Resins • Methylcellulose • Magnesium • Plastics • Aromatics

YOU CAN DEPEND ON DOW

VIEWPOINT — OPINION

BUSINESSMEN and politics—The relationship is one that is getting a lot of sober thought in the aftermath of the election. Some months ago, we pointed out the desirability of business encouraging its employees to make contributions to their political parties *(Viewpoint, Aug. 9)*.

The election results point up the more difficult task: Business firms must encourage employees — top-caliber employees — to go into politics. Politics is a field where "let George do it" is the predominant attitude. Few managements in these days of tough competition want to allow (let alone encourage) up-and-coming executives to do political work. But such encouragement must be given.

Is there a good way to start employees thinking about politics? Here's one possibility: Early in '59, the U.S. Chamber of Commerce will make available a new "package" of discussion materials on the U.S. political system that's similar in physical form to the economic discussion material that has been used by 1,027 25-member discussion groups. The nonpartisan political kit explains how our government works —and gives participants an idea of where they can fit in.

For the chemical process industries, there are specific problems. The trend toward additional regulations — found at all levels of government, from city councils to the U.S. Congress — is one such problem. New proposals on pollution abatement and control, inventory taxes on work-in-progress, clearance of drugs and food-chemicals, and depreciation rules are examples that point up the CPI's need for spokesmen that share our point of view.

The election to Congress of one of the 15 international representatives of the Oil, Chemical & Atomic Workers *(Business Newsletter, Nov. 15)* points up another aspect: If unions actively encourage their own employees to get into politics, can chemical management afford to do less?

H. E. Johnson

Editor-in-Chief

First in the Field

TO THE EDITOR: [Your item] describing formation of the Chemical Equipment Sales Engineers Assn. of Chicago (*CW Technology Newsletter, Oct. 25*) is a worthy bit of news. . . . I wish to compliment you for the space you allowed it. . . . The corresponding New York group, the Chemical Equipment Sales Engineers Assn. of New York . . . was organized in 1951 [*rather than in 1957*—ED.] and has been an active group over the ensuing years. . . . Formation of the Chicago association was stimulated by the New York group and includes one former New York member as well as a chairman pro tem who was closely associated with the New York organization. . . . There will be other associations forming in other cities during the next few years.

EMERSON J. LYONS
President
Chemical Equipment Sales Engineers Assn. of New York
New York

Steam Plant Costs

TO THE EDITOR: In your article "Plan '59—Modernization for the CPI" (*CW, Oct. 11, p. 66*), you quote me as saying, "It's not unheard of for a steam study to net savings equivalent to the capital cost of the plant in the first year." . . . The word "plant" should be replaced with the words "equipment involved."

ARTHUR L. LARSON
Manager
Process Engineering
Hercules Powder Co.
Wilmington, Del.

Down with P——t

TO THE EDITOR: Although your reporter had most of the story correct on glycol-based antifreeze (*CW, Nov. 1, p. 77*), here we are again with the same tune we have been harping on since we originated glycol-based antifreeze in the late '20s.

We wish people would stop using that nasty word "p——t" to refer to antifreeze. We will be forced to wash their cooling systems out with soap.

This piece of mislabeling was not the "key to glycol's initial success"; it came into use during the material shortage days of World War II as a government word. Unfortunately, many in the industry accepted it without question.

GEORGE B. MOYNAHAN
Manager—Advertising
Union Carbide Chemicals Co.
New York

The word "permanent" was used to some extent by antifreeze marketers in the 1930's. An isopropyl alcohol-based antifreeze used this sales argument in the Nov. 4, '39, Saturday Evening Post: *"Though not sold as a permanent antifreeze, Mobil Freezone is long lasting, saves the high cost of the so-called permanent types."*

CW's *article summarized the current situation as follows:*

"But glycol makers are still trying to ease away from labeling their products as 'permanent' — although that was the key to glycol's initial success. Now, producers and retailers plug 'full-season protection' rather than reuse of the antifreeze."—ED.

MEETINGS

Manufacturing Chemists' Assn., semi-annual meeting, Statler Hotel, New York, Nov. 25.

American Institute of Chemical Engineers, annual meeting, Netherland Plaza Hotel, Cincinnati, Dec. 7-10.

American Nuclear Society, winter meeting, Sheraton-Cadillac Hotel, Detroit, Dec. 8-10.

Chemical Specialties Manufacturers Assn., annual meeting, Commodore Hotel, New York, Dec. 9-11.

American Society of Agricultural Engineers, winter meeting, Edgewater Beach Hotel, Chicago, Dec. 15-17.

American Assn. for the Advancement of Science, annual meeting, Sheraton-Park Hotel, Washington, D.C., Dec. 26-31.

Society of Plastics Engineers, 15th annual technical conference, Commodore Hotel, New York, Jan. 27-30.

American Institute of Mining, Metallurgical and Petroleum Engineers, annual meeting, San Francisco, Feb. 15-19.

Technical Assn. of the Pulp and Paper Industry, 44th annual meeting, Commodore Hotel, New York, Feb. 23-26.

American Institute of Chemical Engineers and **American Chemical Society,** sixth annual joint technical meeting, King Edward Hotel, Beaumont, Tex., March 13.

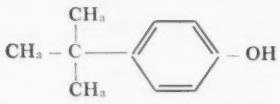
1959 Corrosion Show and 15th annual meeting of the **National Assn. of Corrosion Engineers,** Chicago, March 16-20.

Progress Report...

— *para*-Tertiary-butylphenol
— Ethanolamines
— CARBITOL solvent

Now molten *para*-tertiary-butylphenol available in tank cars

para-Tertiary-butylphenol is now being shipped in molten form in both insulated tank cars and tank trucks. This relatively new chemical is also supplied in near-white flake form in 50-pound bags. Its molecular weight is 150.21 and specific gravity is 0.9081 at 114°/4°C. Freezing point is 97°C.; boiling point, 236°-238°C. at 760 mm. The molecular structure of *para*-tertiary-butylphenol is—



CARBIDE produces *para*-tertiary-butylphenol to these specifications:

para-Tertiary-butylphenol
97 wt. % min.
ortho-Tertiary-butylphenol
1 wt. % max.
Di-tertiary-butylphenols
2 wt. % max.

para-Tertiary-butylphenol is the starting material in the production of oil-soluble phenolic and modified phenolic resins used for varnishes and lacquers. Combined with appropriate drying oils, the resins give light-colored coatings that are rapid-drying, tough, and resistant to light, water, acids, and alkalies.

para-Tertiary-butylphenol is also useful as an intermediate in the manufacture of other products of many types. Among these are antioxidants; water-proof starch finishes and adhesives; pour point depressors and emulsion breakers for petroleum oils; vinyl ether and dimethylol melamine type plastics; tackifiers and vulcanizers for rubber and curing agents for neoprene adhesives; synthetic lubricants; insecticides; and industrial odorants.

This interesting chemical appears destined for many additional applications. For prices and a special Technical Information Bulletin, check the coupon.

Ethanolamines improve cosmetics

CARBIDE's alkanolamines are finding ever more uses in cosmetics and preparations for care of the hair.

Triethanolammonium lauryl sulfate is an essential ingredient of many cosmetic creams and shampoos.

Good detergent action, mild alkalinity, and high lathering ability are some of the advantages of shampoos formulated with mono-, di-, or triethanolamine.

Monoethanolamine of low iron specification is used to make the salt of thioglycolic acid, which serves as the base for cold-permanent-wave lotions.

A comprehensive new booklet, "Alkanolamines and Derivatives," is just off the presses. It contains detailed information on ethanolamines and many suggested uses.

A good mutual solvent

Having trouble finding a good mutual solvent for soap and oil mixtures? Look no farther—CARBIDE's CARBITOL solvent was made for the job.

Small quantities of CARBITOL solvent in mineral oil-soap and mineral oil-sulfonated oil combinations form translucent-to-clear emulsions. It's a fast-acting, thorough solvent for dispersions of this nature.

In SAE-type, moderate and heavy duty brake fluids, CARBITOL solvent is an outstanding diluent. Industrial cleaners containing CARBITOL solvent quickly dissolve water-soluble greases. Textile printing and dyeing solutions get deep penetration and bright shades with CARBITOL solvent.

CARBITOL solvent is one of many important solvents described in the booklet, "CELLOSOLVE and CARBITOL Solvents." Check the coupon to obtain your copy.

Tear out this coupon. Check the boxes on which you'd like more information, and mail to Dept. H, Union Carbide Chemicals Company, 30 East 42nd Street, New York 17, N. Y.

☐ *para*-Tertiary-butylphenol. ☐ Alkanolamines and Derivatives. ☐ "CELLOSOLVE and CARBITOL Solvents."

Name _____

Company _____

Street _____

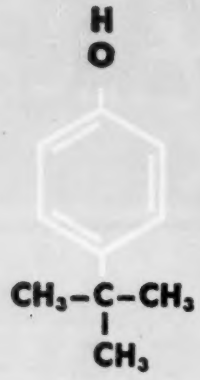
City _____ Zone _____

State _____

And remember, there is a CARBIDE sales office near you where you can obtain the services of a CARBIDE Technical Representative. His wide industry experience is backed both by extensive chemical training and by Technical Specialists.

"Carbitol" and "Union Carbide" are registered trademarks of Union Carbide Corporation.

UNION CARBIDE CHEMICALS COMPANY
DIVISION OF
UNION CARBIDE CORPORATION



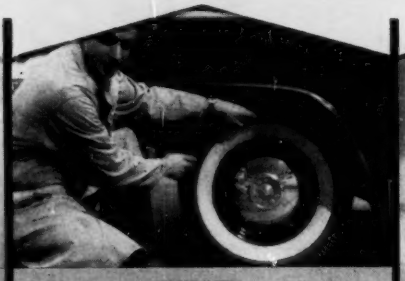
Now in commercial production at Stepan's new Millsdale, Illinois plant (near Joliet) is p-tert-Butylphenol. This new Stepan product . . . one of a series of Stepan substituted phenols . . . can be supplied flaked or as a concentrated solution in caustic. Bulk shipments of the molten Butylphenol can also be made where required. There are a number of interesting commercial and potential uses for p-tert-Butylphenol, and we would be pleased to send you working samples for your evaluation.

Now... a centrally located volume source of

p-tert-Butylphenol

VARNISHES

p-tert-Butylphenol-formaldehyde resins impart rapid drying properties to varnishes, along with improved hardness and durability.



RUBBER

Imparts anti-cracking properties to rubber tires. Useful as an intermediate for curing agents in butyl rubber.

ANTIOXIDANTS

Like most phenolics, p-tert-Butylphenol possesses antioxidant activity that makes it valuable in preserving soap and other sensitive products.

send coupon for samples • bulletin • prices

CW 11 C

STEPAN CHEMICAL COMPANY
427 W. Randolph Street
Chicago 6, Illinois

Gentlemen:

Please send me bulletin on p-tert-Butylphenol and working sample.

Name_____

Firm_____

Address_____

City_____ Zone_____ State_____

STEPAN
CHEMICAL COMPANY
NINOL

427 West Randolph Street, Chicago 6, Illinois
Telephone: STate 2-4711

AMERICA'S MOST COMPLETE LINE OF SURFACTANTS

Business
Newsletter

CHEMICAL WEEK
November 22, 1958

Synthetic Organic Chemical Manufacturers Assn. will fight harder for protection on certain imports.

To deal with recent and future trade legislation, its International Commercial Relations Committee has formed a handful of new subcommittees. They'll deal with European Common Market developments, escape clause and antidumping proceedings, unfair treatment of U.S. exports abroad, "peril point" investigations, tariffs and U.S. exports to Iron Curtain countries.

One of the prime reasons behind this committee action, says President R. W. Hooker, is the "disappearance of the word 'selective' from the Administration's recent request for tariff-cutting powers." SOCMA, of course, doesn't seek to bar all imports. It is out to "defend the domestic . . . field of organic chemistry against inroads by Iron Curtain and other foreign countries."

Actually, SOCMA members now buy Soviet coal chemicals at prices below the comparable U.S. levels. Example: 2,500 tons of naphthalene—reportedly of Russian origin—recently unloaded in Philadelphia from the German ship *Mercator*. It came through Poland, consigned to a Westchester County, N.Y., firm.

•

A much greater outpouring of chemicals from Russia is on the way, if Premier Khrushchev can squeeze out the goals of his new Seven-Year Plan ('59-'65). Actually, some chemical industry targets have been shaved down a bit from those proclaimed last May by Khrushchev (*CW, June 7, p. 13*). Over-all chemical production is now slated to triple by '65. Last spring the goal was a two- to threefold "minimum" rise. Synthetic fibers output (noncellulosic) was slated to rise 4.6 times. Now the goal is down to a fourfold increase. Plastics and synthetic resins, likewise, are now slated for a 670% boost. Last May's target: an eightfold increase.

Vick Chemical has made its first foreign acquisition. The fast-growing concern—through its Vick International subsidiary—has bought for cash about 87% of the 391,922 outstanding ordinary shares of Milton Antiseptic, Ltd. (London), packaged disinfectant and sterilizer producer.

Vick already is in business abroad, through its own overseas plants and sales offices, which last year accounted for some 20% of the company's total of $107 million sales. And more foreign mergers are in the works. Vicks told *CW* that negotiations are underway for acquisitions in "four or five" European and South American countries.

In the past five months, Vick also acquired two U.S. concerns: Walker Laboratories last July, and The Lavoris Co. in October.

Montecatini came up with two surprises at the plastics show in Chicago this week (*p. 22*).

• First, the big Italian chemical and mining concern charges that Germany's Farbwerke Hoechst had no right to sell know-how and a manufacturing license to Hercules Powder for making polypropylene. Montecatini contends that it holds worldwide rights to basic polypropylene technology, except for West Germany, where Montecatini has granted exclusive rights to Professor Karl Ziegler and he has sublicensed Hoechst. Montecatini says it applications for U.S. patents on Giulio Natta's polypropylene discoveries are now pending; and that when and if U.S., patents are granted, Hercules—which is still the only polypropylene producer in this country—will be infringing. Questioned about the situation, Hercules pointed out that no U.S. patents have been issued to Montecatini relating to stereospecific polypropylene. Hercules insists that it has developed its own process for manufacturing the resin, and that this development—in which Hoechst shared—"was not based on any Montecatini patent rights or known-how."

• Second, Montecatini announced that it will build a 60,000-tons/year plant at Brindisi, Italy, to make propylene-ethylene copolymer for "life-time" auto tries, due onstream about two years from now. Besides being more durable than the styrenebutadiene copolymer now used in tire casings, Montecatini says, the copolymer of the two olefins—which Natta discussed earlier this year in San Francisco, (*Technology Newsletter, April 26*)—will be about 10¢/lb. cheaper.

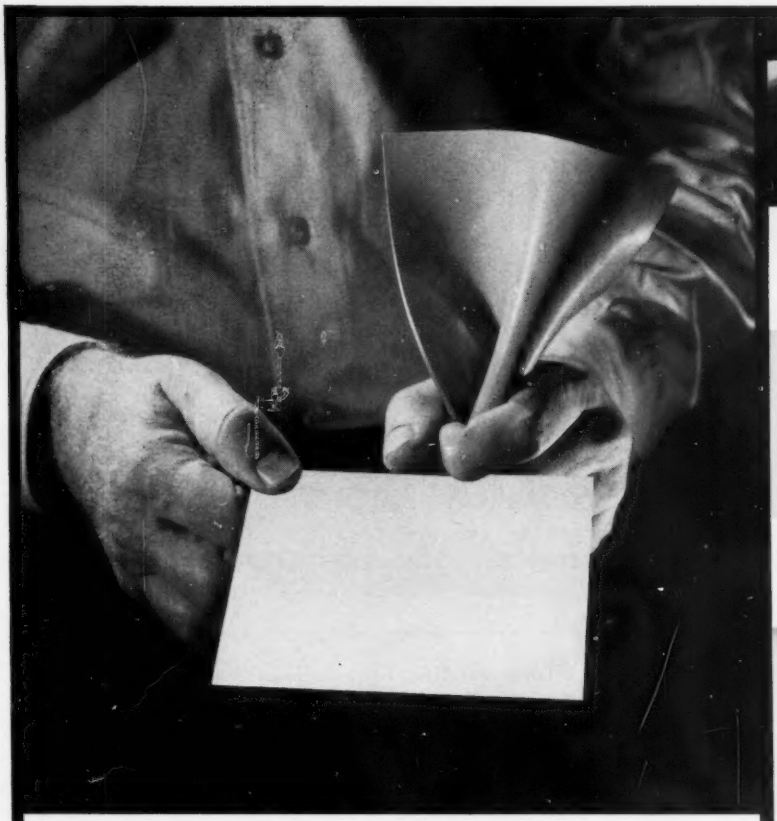
•

This week brought more developments in the General Aniline mixup (*p. 32*).

• Trustees for I. G. Farben In Liquidation—who two weeks ago put in a claim for the General Aniline stock held by the U.S. government—now have shifted their ground. In new petitions submitted in U.S. district court in Washington, the Farben trustees are giving up all claims to return of the GAF stock. But they ask the court "to determine once and for all just who the rightful owners were before proceeds from sale of the stock are given away."

• In Switzerland, a flurry of buying—reportedly for U.S. interests—elevated the price of the stock of Interhandel, the holding company that claims ownership of the GAF shares.

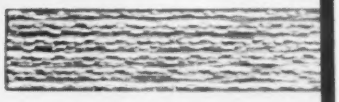
• In New York, two other syndicates interested in bidding on GAF stock, if the government calls for bids, say they would keep GAF intact, not dismember it as the Bache & Co. syndicate would do. One of the syndicates is headed by Lehman Bros., the other by Blythe & Co. One Wall Streeter tabbed the Bache estimate of the GAF stock's sale value—$84 million—"ridiculously low."



BOTH ARE MADE FROM PLASTISOLS. You control the rigidity. The sheet in the foreground has more PMDA and epoxidized plasticizer, for greater rigidity. By varying the ratios of ingredients, you can get hardness from 17 to 80 (Shore D), tensile strength up to 5000/psi and a broad range of elongations. (Figures are based on recent laboratory tests.)

MORE HEAT RESISTANT. PMDA plastisol (left) and commercial rigid vinyl (right) were heated for one and a half hours in an oil bath to 430°F. The rigid plastisol withstood heat while unplasticized vinyl was badly distorted.

COATINGS AND CASTINGS are easily made with liquid-state plastisol system. L. to r.: flow-coated pipe, cast ash tray, cosmetic bottle with strong, colorful vinyl coatings, and dipped tool handle.



LAMINATES REINFORCED WITH GLASS FABRIC can be made because of the good adhesion of PMDA plastisol. Shown here: Rigid plastisol reinforced with 10 layers of glass fabric. Such laminates have load bearing properties at as high as 300°F., compared to 150°F. limit usually placed on commercial rigid PVC.

Look what can now be done with PLASTISOLS!

You can make rigid vinyl castings and moldings with convenient plastisol techniques . . . and a helping hand from Du Pont's PMDA

You're looking at a wide range of products made from plastisols.

Using ordinary plastisol techniques—you can mold, cast, spray, dip, or roller coat to produce such PVC products as coated tool handles, mechanical parts, floor tiles, vinyl-lined pipe, bottle coatings . . . even glass laminates . . . and many more mass production items.

And you get the properties of a tough, rigid vinyl!

Du Pont's PMDA (pyromellitic dianhydride) is the curing agent that makes all this possible. Along with an epoxidized plasticizer with which it reacts to strengthen and harden the resin, PMDA gives the plastisol precisely the rigidity you desire.

To vary the hardness, you vary the quantity of PMDA and epoxidized plasticizer.

This technique offers distinct advantages over other rigid-plastisol systems in that it offers a high maximum hardness, adhesion without a primer, and it does not produce exothermic reaction difficulties.

If you're working on a rigid-vinyl product, it may pay you to look further into this new rigid plastisol technique. To help you in your development work, we can supply PMDA from our new semi-commercial facilities.

Write for additional details. Explosives Department, E. I. du Pont de Nemours & Co. (Inc.), Dept. CW11, 2543 Nemours Building, Wilmington 98, Del.

DU PONT PMDA

DU PONT
REG. U.S. PAT. OFF.

Better Things for Better Living
. . . through Chemistry

Speaking of WATER *for Industry...*

of the nation's 51 principal rivers, 6 flow in the Land of Plenty — where rainfall is 30% above the national average

RESOURCES OF THE LAND OF PLENTY

MARKET: There are 74,066,000 people in *The Land of Plenty* and the states directly bordering it and 1957 retail sales in this market were almost 41% of the U. S. total. ***RAW MATERIALS:*** World's finest all-purpose Bituminous Coal . . . multi-million-ton deposits of Dolomitic limestone and Calcium Carbonate limestone (over 97.7% pure), some in mineable thicknesses of over 100 feet . . . manganese, silica, clays, brines and varied other mineral, forest and farm materials. ***POWER:*** Total installed generating capacity of over 21 million kilowatts — over 1/6 the U. S. total — and more on the way. Low rates. ***MANPOWER:*** Civilian work force of over 8,151,000; 2,650,000 in manufacturing, 1,485,000 in wholesaling and retailing . . . adaptable, home-rooted people with proven high production records; good supply of young workers constantly coming into the market. ***TRANSPORTATION:*** Dependable rail service by Norfolk and Western, one of the world's most modern, most efficient railroads. The N&W has more freight cars per mile of track than any other Class 1 railroad, and since World War II has spent or authorized $456 million in improvements and additions, $70.1 million of this spent in 1957. ***SEAPORT:*** Factories and warehouses in *The Land of Plenty* have access to world markets and sources via the big port of Norfolk on Hampton Roads, one of the best-equipped in the nation. ***INDUSTRIAL GROWTH:*** In 1953-57, 306 new plants on the Norfolk and Western were established (an average of 1 every 6 days). In the same period existing industry invested $562 million in expansion and improvements.

The Ohio, James, New, Roanoke, Scioto, and Potomac Rivers — 6 of the 51 large enough to be classified as principal U. S. Rivers by *Statistical Abstract of the United States* — furnish good industrial water to many large, medium and small industries in *The Land of Plenty*.

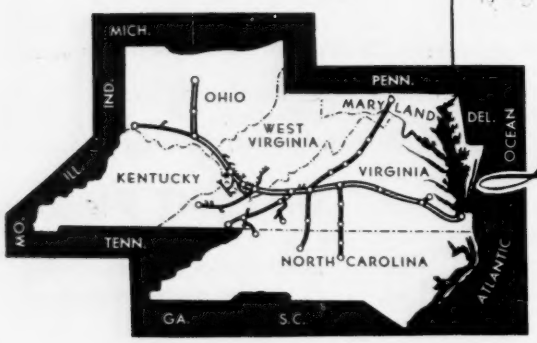
In addition, rivers of secondary size used by industry include the Elizabeth, Nansemond, Appomattox, Dan, Bannister, Pigg, Smith, Shenandoah, Bluestone, Mayo, Holston, Big Sandy and others. In fact, in *The Land of Plenty*, there are 6000 sq. miles of inland, permanent surface waters.

U. S. Weather Bureau figures show rainfall in *The Land of Plenty* to be about 30% above the national average. The U. S. annual rainfall averages 31-36 inches, while that of *The Land of Plenty* is 40-45 inches. And not one of the six states in this region has a lower annual rainfall than the national average.

Let Norfolk and Western plant location specialists tell you about water and other industrial advantages in *The Land of Plenty*. There's no obligation, and all inquiries are kept confidential.

All figures from *Sales Management's 1957 Survey of Buying Power* and *Statistical Abstract of the United States*.

Write, Wire or Call:
L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Drawer CW-810 (Phone DIamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia



Locate IN THE LAND OF PLENTY — THE 6 GREAT STATES SERVED BY

Norfolk and Western RAILWAY

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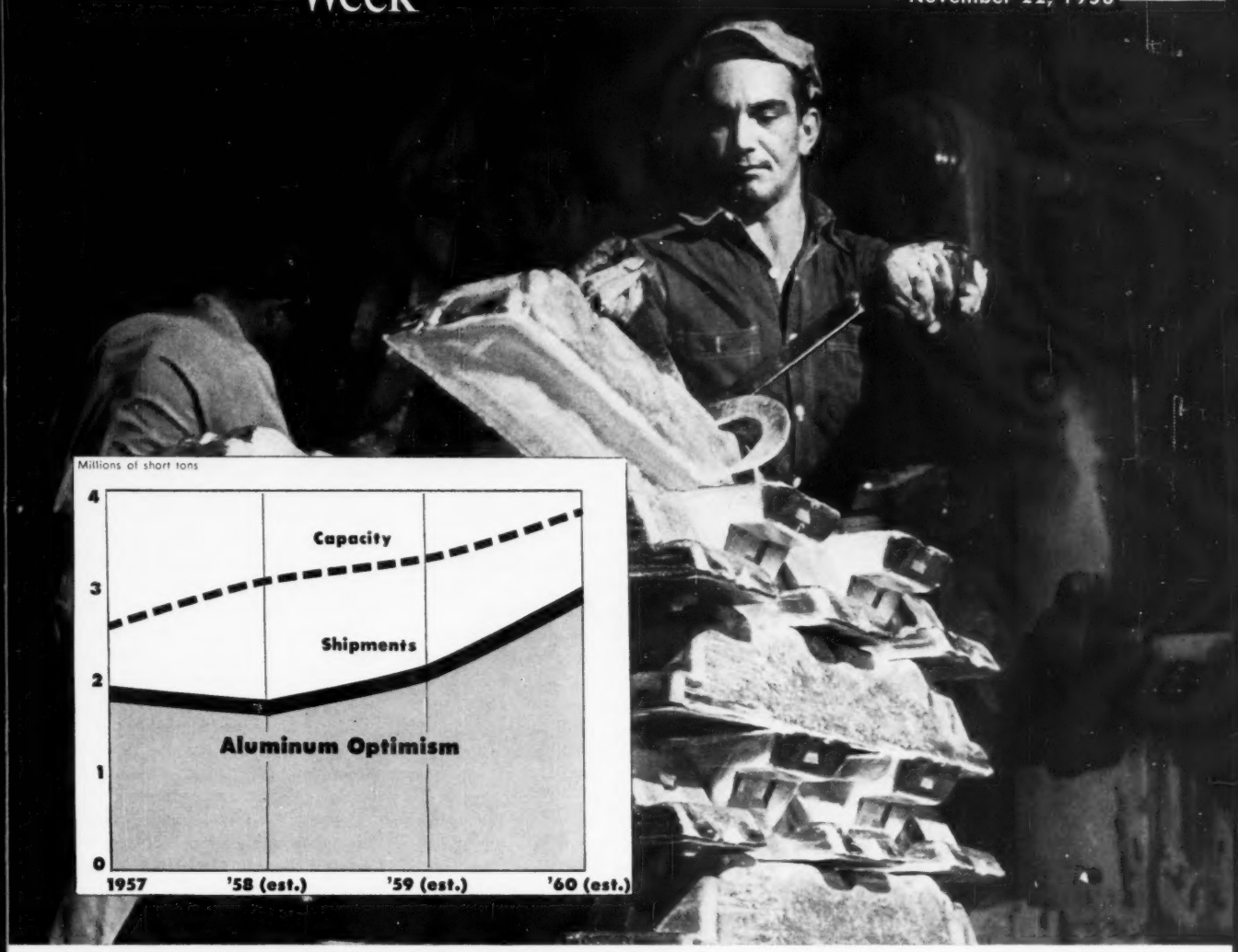
Chemical Week — November 22, 1958



Despite current capacity surplus, aluminum industry drafts growth plans to provide for future demand.

Aluminum Builds for Boom in the 'Sixties

U. S. and Canadian aluminum makers this week are reopening idled production units and proceeding with expansion plans that will boost capacity by 45% in two to three years—this despite sluggish '58 business and slumping aluminum prices. Reason for the buildup: a surge in orders that could foreshadow a full-blown boom, if anticipated demand materializes in the construction, automotive and packaging industries.

Alcoa and Reynolds have recently reopened potlines shut down earlier this year at Massena, N. Y., and Mead, Wash. About 142,000 tons of new capacity is expected to be operating at Massena by mid-'59. And before the end of the year, Ormet will have all five potlines operating at its plant near Clarington, Ohio—bringing production to about 180,000 tons/year. Harvey Aluminum, moreover, has just brought in a new 54,000 tons/year unit in The Dalles, Ore.

Shipments this year, however, are expected to total only 1.75 million tons—about 8% under last year's mark and well below U. S. and Canadian capacity of somewhere near 2.5 million tons/year.

But despite sobering recession losses, aluminum makers are rebounding in sprightly fashion. No expansion plans have been cut back and consumers' inventories are said to be the lowest since World War II.

Fourth the Best: Producers say the fourth quarter could be the best this year—although percentage gains are not expected to be as large as those of the previous quarter.

In the third quarter, for example,

Alcoa tallied sales of $204.1 million (up 10.3% from the second quarter) and $13.3 million profits (boosted 65% from second quarter net). Kaiser Aluminum had sales of $107.8 million (up 9.4%) and profits of $6.9 million (up 27.5%). Reynolds' third-quarter sales were $110.5 million (up 3.4%) although profits at $8.9 million were down 4.7%.

Most look for the really big gains to begin in 1960—aluminum's crucial year. It's then that auto makers are expected to decide whether or not to make all-aluminum engines and other castings for the '61 model automobiles.

And in 1960, if the present rate of pickup continues, business could be fully recovered from the recession. By 1960, moreover, the construction industry—now the biggest consumer of aluminum—is expected to be going at full tilt, consuming huge supplies of the metal.

Whether automobiles or home construction will show the biggest boost in aluminum usage is a source of happy disagreement among industry men.

Housing Has Edge: Home construction appears to have the edge. Alcoa Vice-President and Treasurer E. B. Wilber says that by '63-'65 new homes should be using at least 1,000 lbs. of aluminum apiece. With an average of 1 million new housing starts in the U. S. each year, this means about 1 billion lbs./year —equal to the total output of three large aluminum smelters. In addition, tonnage quantities are already going into office buildings, warehouses and other industrial structures.

A sales vice-president of another aluminum company declines to forecast total demand for the metal in construction in the 1960's. He says the figure might look "outrageously high" in print.

Close Second: But automotive uses may well run a close second to construction. Publicly, officials of major aluminum firms are cautiously optimistic about continued increases for their product in autos. They point out, however, that '58 cars contain an average of 52 lbs. each—a 400% increase since the 1940's. Publicly, Reynolds Vice-President John Bloomquist, as well as other industry men, predicts an average of 200 lbs./automobile by 1970.

Privately, aluminum men say these estimates are highly conservative, because they do not include major developments of the future. The chary figures are based on published auto industry predictions, are adhered to by aluminum men as a matter of courtesy.

Aluminum Engines: One item publicly soft-pedaled is Chevrolet's plan to put an all-aluminum engine in its forthcoming "smaller" car. Perhaps more important from a consumption standpoint is the near certainty that Ford will introduce standard-sized, liquid-cooled aluminum V-8 engines in its 1961 models. GM should follow shortly thereafter.

V-8 engines alone would account for more than 15% of total scheduled 1960 capacity. This, of course, doesn't include tonnage shipments for transmissions, bumpers and trim.

Typical of industry comments is that of Olin Mathieson's aluminum sales vice-president, Derek Richardson. Richardson believes construction demand will probably outpace auto demand for the metal. But he says: "If this conversion [switch to all aluminum engines] occurs to any large extent within the next few years, it could result in total automotive usage exceeding that of the construction industry."

Another big use, already gaining momentum, is aluminum for cans. Kaiser reports that it's supplying aluminum for a large West Coast sardine canner, aluminum beer cans are now being introduced and packagers of other foods have indicated an interest. Kaiser Vice-President D. A. Rhoades figures that a conversion to aluminum of only 10% of today's can output would require 4 million lbs./year of aluminum.

If these tantalizing possibilities materialize, impact on aluminum producers will be great.

"Logical" Increase: One factor that may boost aluminum earnings this quarter, or early in '59, is a strongly rumored price boost. Only executive willing to be quoted on this is Olin Mathieson's Richardson. "It is logical to assume that there will be a price increase during 1959," he says. Last August's increase (7 mills/lb.) did not adequately offset the 2¢/lb. reduction in April." Privately, others concede that such a price hike is probable.

Stress on Selling

At Chicago this week, the 8th National Plastics Exposition and annual national conference (sponsored by the Society of the Plastics Industry) emphasized market development of products that made headlines a year and more ago.

Harking to the "Plastics for Profits" theme of the show, some 210 exhibitors, occupying over 100,000 sq. ft. of Chicago's International Amphitheater, set out to whip up new and expanded business for their best-known products.

Neatly illustrating the show's extreme market-consciousness was the big play by National Aniline (Allied Chemical) for rigid urethane foam. Explained a booth manager, "We're pretty satisfied with flexible foam sales. What we must do now is get the rigid stuff off the ground."

Union Carbide Plastics (formerly Bakelite) featured a new epoxy-resin-handling technique, the Gusmer spray gun, that permits fast-curing epoxies to be spray-molded. It opens up promising big markets such as boat hulls and marine equipment to these materials.

Monsanto's striking rocket-ship exhibit was put together to dramatize the organic and plastics divisions' full line of plastics and intermediates.

Celanese's sales pitch focused sharply on applications of such well-known materials as polyesters, linear polyethylene, propionate molding compounds, polyvinyl acetate emulsions. It displayed a variety of linear polyethylene products ranging from bullet cartridges to lifelike dolls.

Montecatini, through its U.S. sales agent Chemore, turned up with a brightly handsome showcase of polyethylene and polypropylene products, including fabrics woven from 100% polypropylene fibers. Du Pont showed and sold such established items as Teflon, Zytel, Lucite, and variations —e.g., Lucite acrylic sirup and moldable Teflon. With commercial production of Delrin acetal resin expected early in 1959, the company is putting particular emphasis on potential applications of this material in the automotive industry.

Underscoring the dead-earnestness of the marketing effort was this fact; although the show featured about ten fewer firms than the previous one,

GIANT IN THE MAKING?

	No. of Plants	Physical Assets ($ millions – est.)	1958 Sales ($ millions – est.)	Principal Products
W. R. Grace & Co.'s seven chemical divisions	43(1)	$105	$175	Additives, catalysts, copolymer latices, high-density polyethylene, insecticides, plastic packaging, polyvinyl acetate, rare earth salts, reactor materials, resins, sealing compounds, silicon, fertilizers, sulfuric.
General Aniline's Dyestuff and Chemical Division	4(2)	40	65	Acetylene chemicals, iron carbonyl powders, dyes and pigments, intermediates (for dyes, pharmaceuticals and chemicals), surface active agents, textile and rubber chemicals.
Totals	47	145	240	

(1) Including 1 plant in Puerto Rico, 3 in Canada, 8 in other countries.
(2) Including leased facilities in Redstone Arsenal at Huntsville, Ala.

Coveting a Cut of GAF

A new plan for settling the fate of General Aniline & Film Corp. was put forth last week by the New York financial house of Bache and Co. First, however, the courts must decide (CW, Nov. 15, p. 33) who is the rightful owner of the company.

• A syndicate headed by Bache would offer to pay about $84 million for the GAF stock—98% of outstanding shares—that was seized by the U.S. during World War II under the Trading With the Enemy law.

• If this bid is accepted, GAF assets then would be resold in three parts: the Dyestuff & Chemical Division would go to W. R. Grace & Co.; the Ansco Division, to Paramount Pictures Corp.; and the Ozalid Division, to Daystrom Inc.

Highly Problematical: The entire sequence of events, of course, is dependent on the outcome of the complex litigation over ownership of the vested GAF stock. Both in U.S. district court at Washington, D. C., and in the International Court of Justice at The Hague, The Netherlands, Interhandel is contending that the stock was Swiss-owned and should never have been seized. The Justice Dept.—now backed by I. G. Farben's liquidating trustees—assert that Interhandel was only a "front" for German ownership.

And even if a firm offer by Bache and the Farben trustees' threat of intervention help to precipitate a settlement, the new proposal would still face several hitches. It's conceivable that some other investors might seek to outbid Bache, or that Bache and the three prospective ultimate buyers might not be able to come to terms on purchase price.

But if the whole deal goes through, it would result in a strapping 37% addition to Grace's chemical enterprises and make Grace the ninth-ranking company in the U.S. in terms of chemical sales. Comparison of Grace and GAF's product lines (*table, left*) indicates that this acquisition — like Grace's previous chemical mergers — would broaden the company's chemical operation, rather than put Grace deeper into any particular commodities.

More Potent Patents

U.S. chemical and pharmaceutical producers selling abroad can look forward to improvement of their competitive positions through stronger patent and trademark protection.

This outlook stems from concessions won by the U.S. delegation —headed by Patent Commissioner Robert Watson—to the recently completed conference for Revision of the International Convention for Protection of Industrial Property, a 40-nation session in Lisbon, Portugal.

One U.S. victory was scored in the long-standing controversy over what kinds of abuses can justify government actions such as compulsory licensing and patent revocation. Under the convention, governments can force an owner to license his patent to competitors if the government feels such action is in the "public interest." In countries like England and several Scandinavian nations, the principle has been applied broadly—and often soon after the patent has been issued.

Licensing Limited: At the Lisbon conference, conditions justifying compulsory licensing were narrowed down to cases of "failure to work"—cases in which the patent owner fails to produce or sell the product.

Just what constitutes "failure to work?" Too often, U.S. officials feel, the clause has been invoked when a patent holder has imported the product, instead of manufacturing it within the country that issued the patent. In some smaller countries, they point out, manufacturing is too costly. The issue remains unsettled.

The convention gave patent holders greater protection in countries like France that lack a patent search system. It lengthens from three to four years the period of grace between the time a patent is granted and when its owner is forced to issue compulsory licenses. Elsewhere, the three-year grace period was retained.

Victory in Trademarks: U.S. exporters scored a major victory in

trademark protection. One of the measures cracks down on companies pirating trademarks owned by a foreign company. It is aimed at sales agents in the vast majority of "civil law" nations, where trademarks are granted without the applicant's having to put his mark into commercial use before winning protection (as he must do in the U.S. and England). In such countries, a sales agent for a U.S. firm can register his U.S. supplier's trademark, then use it himself or sell it to another manufacturer.

The new provision allows foreign producers to oppose such a registration while it is still before the trademark office, or seek its revocation.

Another provision will further bolster trademark protection. It provides that a country's domestic trademark laws must comply fully with the convention's provisions before the country can become a member.

WIDE WORLD

Patent Chief Watson: For U.S. exporters, stronger status abroad.

Status Quo Stands: But U.S. interests lost out on the single most important issue debated at the conference—the principle that all countries should grant patents on chemical and pharmaceutical products, as well as on processes.

Instead, the conference settled on a nonbinding resolution that keeps the way clear for countries like Italy to continue barring product patents. This restrictive policy has been a major sore point with U.S. producers manufacturing or selling abroad.

PROSPECTIVE CHEMICAL FUEL SUPPLIERS

For B-70 Bomber and F-108 Interceptor

- **AFN, INC.**
  American Potash & Chemical
  Food Machinery & Chemical
  National Distillers & Chemical
- **CALLERY CHEMICAL**
  Mine Safety Appliance
  Gulf Oil
- **METAL HYDRIDES**
- **OLIN MATHIESON CHEMICAL**
- **STAUFFER-AEROJET**
  Stauffer Chemical
  Aerojet-General
- **U.S. BORAX & CHEMICAL**

Who'll Keep 'em Flying?

With chemicals-burning supersonic military aircraft now moving into the production phase, there's freshly enhanced interest in the question of who'll get the fuel supply business—which is expected to run into hundreds of millions of dollars.

There's no doubt that the potential market is a big one; it's estimated that the 2,000-mph. "chemical bomber" will consume boron-based fuel at a rate of more than 25,000 lbs./hour (*CW, Jan. 4, p. 17*). And chemical companies now researching alkyl borane and other high-energy fuels (*table, above*) are likely to be first in line when it is time to award sizable contracts for production of whichever "zip fuel" wins out.

That time may not be so far off. Last week, North American Aviation —prime contractor on the two projects—revealed that it's ready to start letting important subcontracts on both the B-70 bomber and the F-108 long-range interceptor planes. Thus, it appears that prototypes of these manned aircraft will be in the air by 1960—and that high-energy fuel will be needed from then on.

Chemical Fuel for Cruising: It's already pretty certain that both planes will be powered by General Electric's model J93 turbojet engines—six on each B-70, two on each F-108. It's envisioned that petroleum-based jet fuel would be used most of the time but that chemical fuel would be used in the afterburners from the start of straight and level cruise. Under this flight scheme, the B-70 will have a range of more than 7,000 miles at 70,000-ft. altitude. A further estimate: a group of 30 B-70 bombers, using high-energy fuel only about 25% of flight time, might require 105,000 tons of boron fuel per year.

Which companies are in the lead for fuel supply contracts? Olin Mathieson certainly is bidding for a prominent role in the developmental work; it started up a $4.5-million plant last May to make alkyl boranes for both the Navy and Air Force, and next summer expects to complete a $45-million plant for the Air Force.

Callery Chemical also has two important fuel development plant projects, both for the Navy.

Borax Producers' Stake: It's obvious that the borax producers have a big stake in high-energy fuels, and these companies are all taking a hand in the research and development work. American Potash & Chemical, with a one-third interest in AFN, is managing that concern's fuel project at Henderson, Nev. Stauffer Chemical is wholeheartedly backing the research work of its joint venture with Aerojet-General. And U. S. Borax & Chemical—though concentrating mainly on solid propellents —says it's doing "limited" research on liquid fuels for aircraft.

Metal Hydrides isn't turning out finished fuels, but its work on intermediates could conceivably lead to a major production contract. It's making sodium borohydride for use in making diborane.

Pentagon officials tell *CW* that the rumor to the effect that up to 20 $200-million chemical fuel plants will be needed by 1963 is an exaggeration. But even so, the outlook is that this new chemical market will be big by any standard.

COMPANIES

The Flintkote Co.'s board of directors has recommended a stock consolidation: one new share for each two outstanding. The proposal comes up for a stockholders' vote on March 25.

•

The Bostrom Corp. (Milwaukee), vehicle seat manufacturer, has set up a chemical division to produce molded polyurethane and vinyl-covered foam products. Bostrom has a process for "integral molding" of foam and vinyl "skin."

•

Arkansas Louisiana Gas Co. (Shreveport, La.) has set up another subsidiary—Arkansas Louisiana Chemical Corp. It has taken over operation of the parent company's Pine Bluff Arsenal chlorine and caustic plant. Capacity is rated at 75 tons/day chlorine, 80 tons/day caustic. The new arm also operates ALG's eight natural gas extraction units in Arkansas, Louisiana and Texas, including the expanding Magnolia, Ark., unit. During the past 14 months, the utility has formed five subsidiaries. One of them, Arkansas Cement Corp., will soon begin operations at a new $14-million plant near Foreman.

•

Chemetron Corp. sliced its December dividend from 45¢ to 25¢, after nine-month earnings plunged 77% from last year's three-quarter level. For the '58 period, sales totaled $84 million, a 27% drop. By September, the company reports, sales of National Cylinder Gas Division were almost back to '57 levels, but the six other divisions' sales didn't pick up until October.

•

Fluor Corp. will take out a $5-million long-term loan from two insurance companies and a bank. Purpose: to refund $1.5 million in outstanding long-term notes, and for general corporate use.

EXPANSION

Paper Size: Monsanto is stepping up production of its fortified rosin size for paper. At its Seattle plant, the firm has started building a unit to supplement size production of its Baxley, Ga., and Montreal plants. It's due onstream early in '59. And at its Nitro, W. Va., plant, Monsanto, with Emery Industries as co-operator, has started putting in a size unit to tie in with the tall-oil plant completed last summer. Nitro's working force is now almost up to full size strength, after 40 of 55 previously furloughed workers were recalled.

•

Chemicals: Stauffer is expanding the manufacturing and laboratory facilities of its subsidiary, Anderson Chemical Co., at Weston, Mich. The $200,000 project includes enlargement of the main plant, a mini- and pilot plant, labs, offices and warehouses.

Pharmaceuticals: Parke, Davis & Co. has detailed its five-year, $50-million expansion program. It will spend $2 million remodeling its executive offices in Detroit, and $12.5 million for research facilities in Ann Arbor. Remainder will go for combination branch offices and warehouses in Chicago, San Francisco, Kansas City, Baltimore, and Montreal, with $4 million total for manufacturing laboratories and branch offices in Bogota, Colombia; San Juan, Puerto Rico; Johannesburg, South Africa; and Bombay, India.

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Lithium Perchlorate: HEF, the Hooker Chemical-Foote Mineral joint venture, says it is building "the nation's only plant capable of producing lithium perchlorate commercially," at Columbus, Ga. The plant previously was described only as a producer of ammonium perchlorate, for high-energy fuel oxidizers. Now, HEF says the plant can produce lithium perchlorate "with equal facility, should emphasis be switched to lithium perchlorate in the missile program." The plant's site is adjacent to Hooker's sodium chlorate plant. Ammonium perchlorate capacity will be 4 million lbs./year.

FOREIGN

Paints/Central America: Glidden International, C.A. (overseas arm of The Glidden Co.) and the newly formed Pinturas Central Americanas, S.A. (Guatemala City), will build "the largest paint manufacturing facility in Central America." Glidden will provide technical know-how for the new firm, in which it holds a one-third interest. The plant will be operating by early '59.

•

Chemicals/Israel: Construction of a major chemical complex that "could give a new look to Israel's balance of payments" has been proposed by the Ministry of Development Technical Advisory Board, headed by English scientist Sir Ben Lockspeiser. Products would include elemental phosphorus and aluminum. The new plant would take advantage of the Negev area's mineral wealth (which includes light elements and halogens).

Meanwhile, Israel's largest industrial combine, Fertilizers & Chemicals Ltd., has contracted to provide chemical and engineering know-how for a dicalcium phosphate plant, to be built in Belgium by Krebs & Co. (Paris).

•

Chemicals/England: Fisons Ltd. has revealed sales figures for the first time. The chemical and fertilizer producer reports sales totaled $132.7 million during the fiscal year ending June 30, up $7.5 million from the previous year. Chemicals other than fertilizers now account for about 25% of sales, and Chairman Sir Clavering Fison says he is aiming for a 50-50 ratio. Principal chemical products: pesticides, pharmaceuticals, industrial fine chemicals.

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FRUEHAUF TRAILERS

Washington
Newsletter

CHEMICAL WEEK
November 22, 1958

Agriculture may be just as big a market for fertilizer, insecticides, and other chemical industry products next year, even though it won't be as prosperous as in '58.

That's the consensus of this week's "outlook conference" put on by the Department of Agriculture—a conference that's regarded as one of the significant annual government forecasts for business next year. Agriculture's top economists see business as a whole optimistically—a higher level of activity all across the board—but they see the farmer sliding off from this year's peak.

Farm output will be higher, but costs of production will rise. Prices will be lower, and government subsidy checks smaller. That's the gist of the official findings. Hence, they estimate the farmer's net income in '59 as being 10% lower than this year's $13 billion. This year's net (cash receipts minus cost of production plus government subsidies) was 20% above '57.

This year's record crops pushed income to the highest level in five years despite the fact that total acreage planted was the lowest in 40 years. The year's record proved the old economic law which says that farmers keep their best land in production when they have to cut back—and then apply more fertilizer and use better farming methods to boost output. Good weather helps—and the farmers got it this year.

Bumper crops are forecast again for next year. Some 17 million acres of land will be returned to production because of the scrapping of the acreage reserve section of the soil bank. The big carryover of stocks from this year combined with heavy production in 1959 will be enough to drive down prices.

At the same time, the cost of processing and marketing farm products will continue rising.

Production of naval stores is an exception to the general rule. Rosin and turpentine stocks should be slightly lower at the end of the current year (March 31, '59) and prices are expected to post a 4% increase for the year.

But for fats and oils the outlook is for higher production and somewhat lower prices. Exception: slightly higher tung oil tags.

•

Chemical firms spend $200-250 million/year for air pollution control or avoidance. That's what Gen. John E. Hull, president of MCA, told the first national conference on air pollution this week in Washington. Although the expenditure includes amortization of investment in equipment, operation and maintenance, Hull said, it does not take into account the cost of pollution abatement research that chemical companies are also doing.

Washington Newsletter

(Continued)

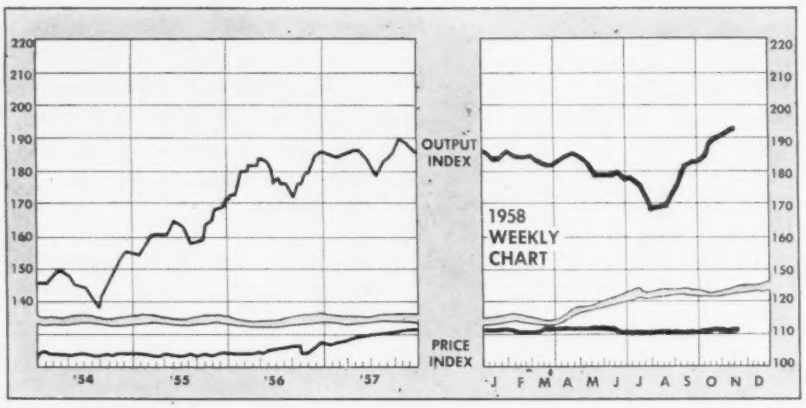
The best hope for "sensible and effective" control of air pollution lies in scientific investigation, Hull said. But he hammered hard at another equally important factor—that of public understanding. Hull told the conference that public understanding of air pollution is "the part of the problem where we have been the least successful, and I think all of us share the blame."

•

The U.S. Supreme Court completed its coal-tar color hearings this week. This is the case in which the Secretary of Health, Education and Welfare wants to upset a lower court order, directing him to keep the coal-tar color F D & C Red 32 on the approved list of harmless colors. This color is used in coloring Texas and Florida oranges.

Before the Supreme Court, the government contended F D & C Red is not required in the production of oranges, and, because it is toxic *per se*, cannot be used even with limitations. Attorneys for the Florida Citrus Commission and other industry groups told the justices the lower court correctly interpreted long-standing provisions of the Food Drug and Cosmetic Act to require the government to set tolerances for safe use of F D & C Red 32.

The Supreme Court's decision can be expected in several weeks.

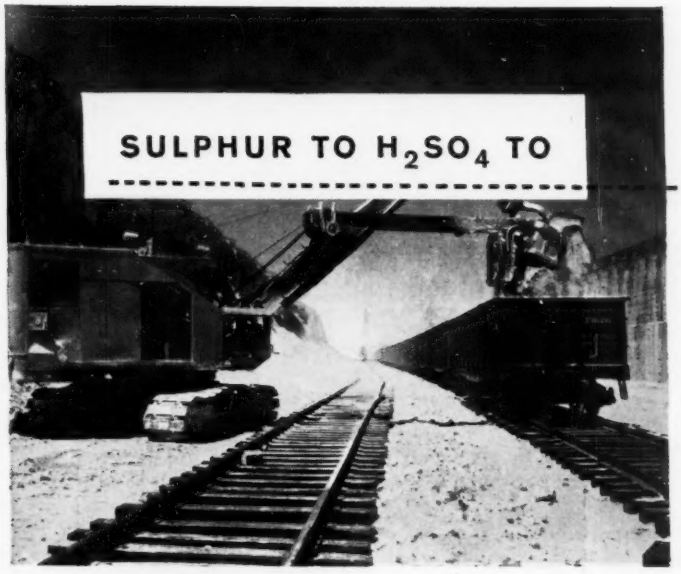


Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	194.5	193.0	190.0
Chemical Week wholesale price index (1947=100)	111.4	111.2	111.2
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	47.97	46.00	37.97

MONTHLY Trade (Million Dollars)	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All manufacturing	26,639	26,388	28,215	49,250	49,425	54.166
Chemicals and allied products	2,046	2,003	1,951	3,721	3,734	3,741
Petroleum and coal products	2,858	2,787	2,803	3,283	3,274	3,597

SULPHUR ONE OF THE FOUR STRONG PILLARS OF PROCESSING



29% Fertilizer
(Superphosphate; ammonium sulphate)
21% Chemicals
9% Petroleum
7% Paint & Pigment
5% Steel
4% Rayon
2% Others

Tinker to Evers to Chance . . . Those of us with gray hair remember well that sure-fire, double play combination of the old Chicago Cubs.

Sulphur, too, is playing the major role in many an industrial 'double play'. With Sulphuric Acid as the keystone derivative, Sulphur is serving six major processing industries with big tonnages and countless others requiring smaller tonnages.

In this connection, the following statistics may be of interest:

The sulphuric acid industry consumes 82% of all elemental sulphur and its equivalent produced in the States. Of this 82%, about two-thirds comes from Frasch Process Sulphur and from the treatment of natural sour gas. The balance is from pyrite, roaster gases, recycling of spent acids, etc.

Texas Gulf, the leading producer of Frasch mined and sour gas Sulphur, has always been and will continue to be industry's reliable source of supply. Recently, a new mine in Texas came into production. Other developments both in mining and sour gas-treatment are nearing completion. To broaden its service to users of Sulphur, Texas Gulf recently inaugurated shipments of molten Sulphur. Distribution centers are being set up.

To be a leader in industry, a company must give service and develop in anticipation of needs. This role, Texas Gulf Sulphur will continue to play to the best of its resources and ability.

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GLYCO® specialty chemicals open doors to new markets

Dimethyl Hydantoin is proving the key intermediate in widely diverse commercial products like powdered bleaches, cosmetics, and aerosol hair sprays. Other derivatives are being used in paper coating processes and in synthetic elastomers.

Large tonnage production of this new basic chemical is also making it advantageous for many other applications never before considered practical.

To meet this increasing number of uses for Dimethyl Hydantoin and its derivatives — and a wide range of other specialty chemicals — Glyco has constructed large, modern chemical production facilities at its Williamsport, Pa. plant. To learn how Glyco can serve *you*, send for information and technical data.

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Recharged for a Rebound

In the next few weeks, a well-known product will appear on the counters of automotive specialty retailers in a newly designed package. Prominent on the package will be a seal with the legend "government tested and proved." The product is Jess M. Ritchie's controversial AD-X2 battery additive.

Apparently undaunted by past legal difficulties with the government *(CW, May 26, '56, p. 21)*, the indefatigable president of Pioneers, Inc. (Oakland, Calif.) anticipates a bright business future.

In a "turnabout's fair play" maneuver, Ritchie is trying to turn government attacks on his product (by the Post Office, the Bureau of Standards and the Federal Trade Commission) into tacit endorsements. Ritchie last week discussed his plans in a question-and-answer session with *CW*.

Q: What's the sales outlook for AD-X2 for '59?

A: We expect sales to exceed 2 million treatment packages. At a retail price of $3/package, that will total around $6 million or more. This is conservative, and we wouldn't be surprised if sales were double this.

Q: What's the potential?

A: The market is fantastic. Total potential is over 100 million packages a year. To arrive at this, we used Dept. of Commerce figures for total sales of batteries for industrial use and for commercial and passenger automobiles.

Q: Have major oil companies shown any interest in selling your product through service stations?

A: No, they're too close to the lead industry.

Q: Have you heard any more criticism from battery manufacturers?

A: They've been very quiet.

Q: What kind of sales organization do you have now?

A: We have a new and exclusive sales agreement with Battery AD-X2 Sales Corp. of San Francisco. It's an independent California corporation headed by Edward N. Hermsen, who is Western regional manager for Research Institute of America, Inc.

Q: How long have you had this arrangement?

A: Since July '58—although they've been selling only about 60 days. During that time, they've sold 78,000 treatment packages, which represents $234,000.

Q: Is the sales setup complete?

A: No, the sales people are busy setting up state franchises. To date, they've established franchises in Washington, southern California, Illinois, parts of Indiana, Arkansas, Tennessee, Texas and Minnesota. They're concentrating now in the Central states, around Chicago.

Q: When you were going about redesigning the package, did you have any thought of changing the name?

A: No.

Q: Will you change the product?

A: No, we have never changed the product or the price.

Q: How serious was the damage to your business from the lengthy investigations by federal agencies?

A: Well, I figure eight years of my life was wasted. Financially, it cost a minimum of $14 million, although we only listed 10% of that in our recent petition for damages. The $14 million is a minimum figure based on contracts that had been signed with reliable business people for orders through '56.

Q: How much did it cost you, out of pocket?

A: The figure we arrived at for our claim to the government is $587,-164.30 direct damages. That would cover expenses and salaries not paid.

Q: What were your sales before the wrangling began?

A: We had just started this business when the government criticism of battery additives began, but we had high hopes. Here are total retail sales figures starting with '47: '47, $3,600; '48, $58,000; '49, $60,000; '50, $270,000; '51, $738,000; '52, $156,-000; '53, $234,000; '54, $120,000; '55, $50,000; '56, $30,000; '57, $150,000; '58 (first half), $210,000.

Q: What kind of sales were made during the investigation?

A: Only replacement sales. We didn't have a sales organization and all our money was going into the fight. After the case was dismissed by the Federal Trade Commission in

CW PHOTO—HAAS

Jess Ritchie today; brawling with the government hasn't dimmed his hopes for ADX-2 sales of $6 million in '59.

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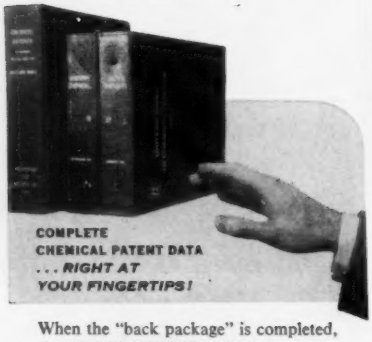

When the "back package" is completed, the 1950-54 UNITERM Indexes, along with 1955 and later Indexes published by IFI, will constitute the largest volume of current scientific and technical information available in one system—100,000 chemical patents with more than two-and-one-half million references.

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CHEMISTRY • ATOMIC ENERGY • ELECTRONICS

May '56, we were so doggoned exhausted we took only repeat orders until Sept. '57. Then we undertook a mail-order campaign through another organization. We didn't like it, however, and although we had sold 350,000 AD-X2 treatments we canceled the arrangements in July when Mr. Hermsen took over.

Q: What about the publicity you got? Do you think it will be hard to live down?

A: Actually, it made people aware of AD-X2, and that's a good thing. It is the most publicized product in the whole country. There were at least 100,000 stories on it, some in major national magazines. We have piles and piles of clippings, and they are still coming in.

Push-Button Sales

Speaking before the Chicago Section of the American Chemical Society, Morris J. Root, technical director of G. Barr, said that the American consumer's enthusiasm for aerosol products has built pressure packaging into a $450-million business with a huge appetite for chemical products.

Last year, he reported, pressure packagers used 43,000 tons of such liquefied gases as Freon, Genetron and Isotron. This, he pointed out, tops the refrigeration industry's annual requirement of 31,000 tons.

In making close to 340 million units of products such as hair lacquer, shaving lather and insecticides, the pressure packagers used 1½ million gal. of ethyl alcohol, 750,000 lbs. of synthetic resins and 54,000 tons of steel. In addition, about $3.5 million worth of plastics went for aerosol container valves, caps and dip tubes. Some 200,000,000 ft. of polyethylene tubing were used in the pressurized packages.

Tolerance Petitions

Monsanto Chemical Co. is the first company to petition for a safety tolerance under the recently enacted food additives law. The Monsanto petition (filed Nov. 5) is for an antioxidant: 1,2-dihydro-6-ethoxy-2, 2,4 trimethylquinoline. It's designed for use in livestock feed. Monsanto's asking for a safety tolerance of 150 ppm. for the antioxidant.

PRODUCTS

Low-Cost Emulsion: A new emulsion binder for paper coatings, at 20¢/lb., said to be 25% cheaper than comparable binders, is now being offered by the Dewey and Almy Chemical Division of W. R. Grace & Co. (Cambridge, Mass.). The new emulsion, called Everflex MC-300, is a fully saturated vinyl acetate copolymer, forms a film that is claimed to be grease-resistant and completely free of odor. The material's high surface area is said to be the result of particles averaging only 0.1 micron.

•

Calgon Goes Dry: Calgon Co. (Pittsburgh) is now marketing Calgon Instant Dry Bleach. The new product, a combination of a newly developed chlorine-liberating material and Instant Calgon, is said to give superior bleaching action, starch penetration and rinsing properties, as well as high stain-removing powers. It's available in 25- and 100-lb. drums, will be marketed through laundry supply distributors.

•

Epoxy Sticks: Robert Marks Co. (Providence, R.I.) is now offering an epoxy adhesive in stick form. Marks says its adhesive is easy to use: heat parts to about 225-250 F, rub stick on parts, then assemble and cure. According to the company, the new product bonds all types of metals, ceramics, carbides and carbon to each other or to themselves.

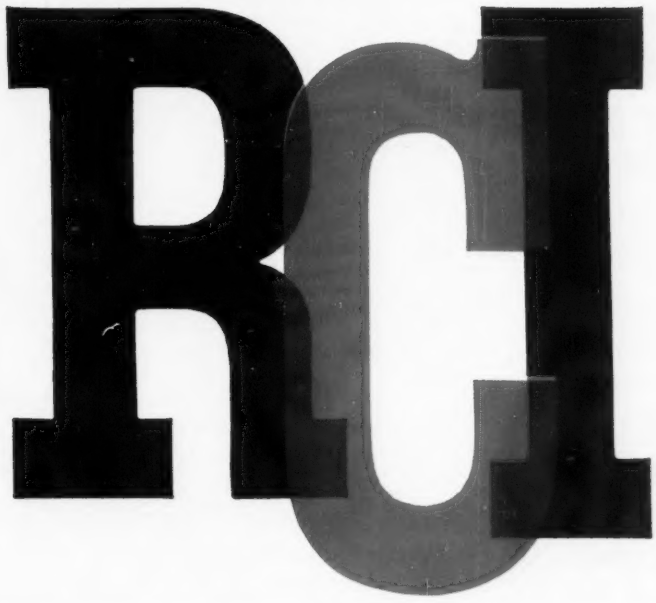
•

Foiling Moths: There's a new way to store moth and mildew-susceptible clothing that not only is more effective in killing bugs but also could boost consumption of moth crystals. According to the Moth and Carpet Beetle Control Institute, articles to be stored should be sprinkled with a liberal dose of moth crystals and folded into an aluminum foil wrapper. The foil wrapper is then sealed with cellophane or masking tape, and packed away. MCBCI says its new packing method renders clothes resistant to moths, carpet beetles and mildew, also keeps rats and mice away.

•

Silver Braze: Fusion Engineering (Cleveland) has just developed a new paste alloy for automatic silver-brazing operations. The new paste, containing standard silver-brazing alloys

14 basic chemicals you can BUY FROM



FORMALDEHYDE — An important raw material in the manufacture of resins, adhesives, textiles, leather, rubber and numerous other products. It is marketed by RCI in five different concentrations. *__GLYCERINE__ — Used in the manufacture of synthetic resins, pharmaceuticals, cosmetics, food products and as a humectant. *__HYDROCHLORIC ACID__ — Has wide application in the chemical industry for pickling and cleaning metals, processing textiles, refining ores and in the manufacture of chemicals generally. **MALEIC ANHYDRIDE** — Principally used in the manufacture of synthetic resins, polyesters, synthetic drying oils, and related products. Its highly reactive structure lends to the synthesis of complex organic chemicals by the Diels-Alder Process. **METHANOL** — A widely used solvent and chemical intermediate for the manufacture of formaldehyde, rocket fuels, amines and esters. **ORTHO-PHENYLPHENOL** — A very effective fungicide and bactericide used in many industrial applications for outstanding preservation. **PENTACHLOROPHENOL** — Used in various fungicides, bactericides, algicides and herbicides; in agriculture, lumber, pulp and paper applications. **SODIUM PENTACHLOROPHENOL** — The H_2O soluble salt of penta used to prevent microbiological attack on many organic substances such as wood, adhesives, protein materials. **PENTAERYTHRITOL** — Used primarily in the manufacture of alkyd resins. Imparts better film properties such as high gloss and gloss retention, good durability, faster drying. Used also in ester gums and synthetic drying aids. **PHENOL** — A building block in the plastics industry. Also widely used in the intermediates required for the production of synthetic detergents, lubricating oil additives, insecticides, bactericides and pharmaceuticals. **PHTHALIC ANHYDRIDE** — Used extensively in the manufacture of alkyd resins, plasticizers, organic pigments and dyestuffs, and pharmaceuticals, as well as other fine chemical intermediates. *__SEBACIC ACID__ — Sebacic acid esters are finding increased usage as plasticizers for PVC systems and as safe, non-flammable jet engine lubricants. **SODIUM SULFITE** — Primarily used by the paper industry in the manufacture of kraft paper and fiber board by the semi-chemical hard wood process. *__SULFURIC ACID__ — A basic commodity used in the paper, dye and pigment, textile, fertilizer and organic chemical industries.

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SPECIALTIES

and special silver-brazing fluxes, is said to eliminate separate application of braze alloy and flux.

•

All-Purpose Parter: Hastings Plastics, Inc. (Santa Monica, Calif.), has come up with an all-purpose parting agent, which is said to simplify removal of phenolic, epoxy, polyester and polyurethane parts from their molds. Price: 75¢/lb. in 5-gal. pails.

•

Headache Pills: Warner-Chilcott Laboratories (Morris Plains, N.J.) has a new tablet called Sinutab for treatment and prevention of sinus headache. Each tablet, says Warner-Chilcott, contains 150 mg. of N-acetyl-*p*-aminophenol, 150 mg. of acetophenetidin, 25 mg. of phenylpropanolamine hydrochloride, and 22 mg. of phenyltoloxamine dihydrogen citrate.

•

The Pause That Relaxes: Wyeth Laboratories (Philadelphia) is offering the first liquid dosage form of meprobamate. Called Equanil Suspension the preparation is available in 4-fluid-ounce bottles. Each five cc. teaspoon of the product contains 200 mg. of meprobamate.

•

Copy Cane: Cane Wax 511, a new hard vegetable wax developed for typewriter carbon paper is now being distributed by Warwick Wax Co. (New York). The wax is produced for Warwick by the Sugar Cane Wax Enterprise refinery at Gramercy, La. It sells for around 75¢/lb.

•

Homecoming: Toxaphene, Hercules Powder Co.'s agricultural insecticide, has now been officially accepted for registration as a household insecticide.

•

Clean Sweep: Mr. Clean, P&G's answer to Lestoil, will go into wider distribution this week. Memphis and San Francisco stores will now sell it.

•

Stymies Staphylococcus: White King Soap Co. (Los Angeles) is offering a liquid rinse for linens and blankets which is designed to kill staphylococcus and other infectious organisms. The product, called Germi-San, is nonflammable, nonvolatile, odorless, and nontoxic. It can be used on walls, floors, furniture and other areas as well as on fabrics. Price $5.20/gal.

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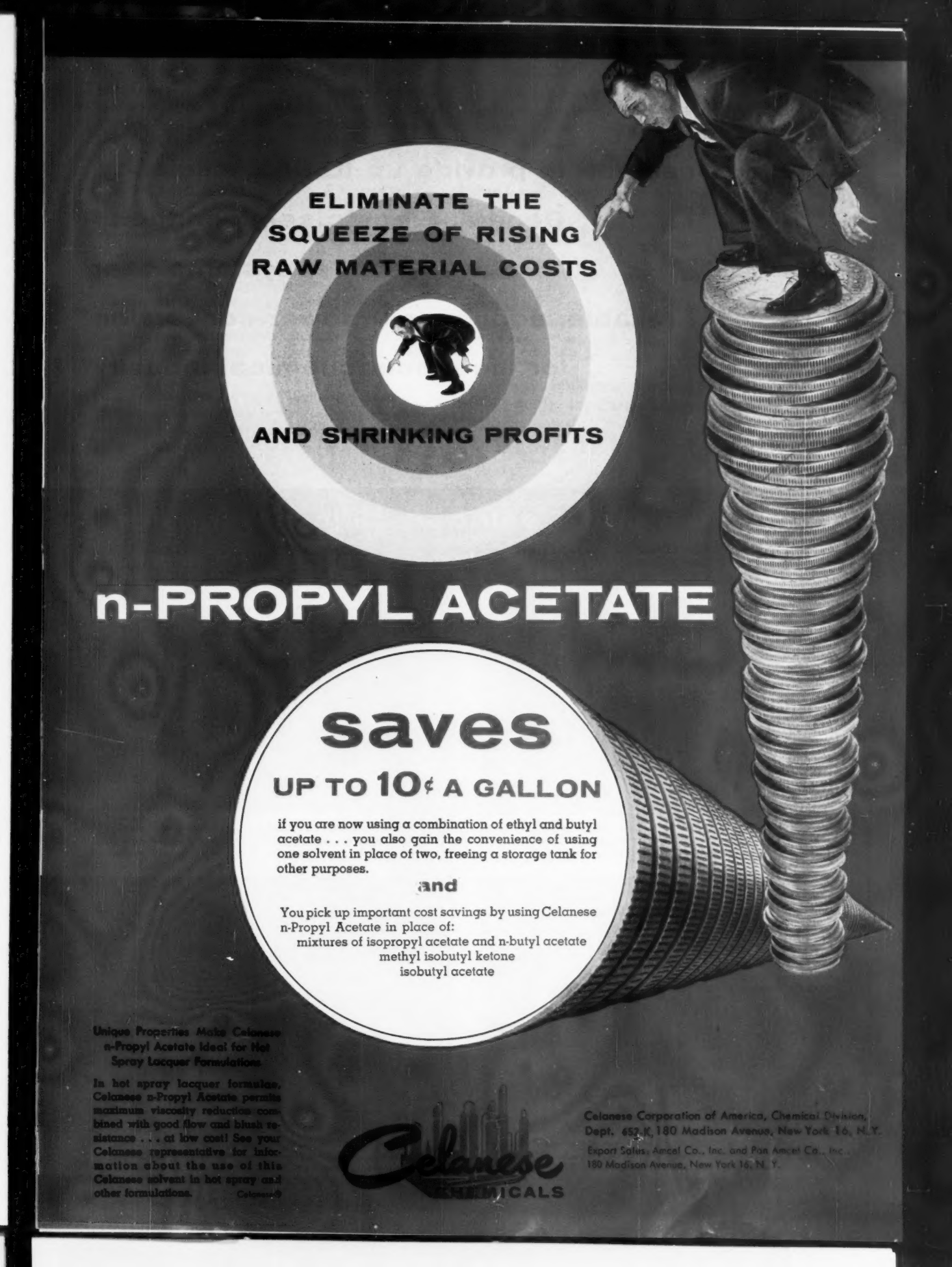
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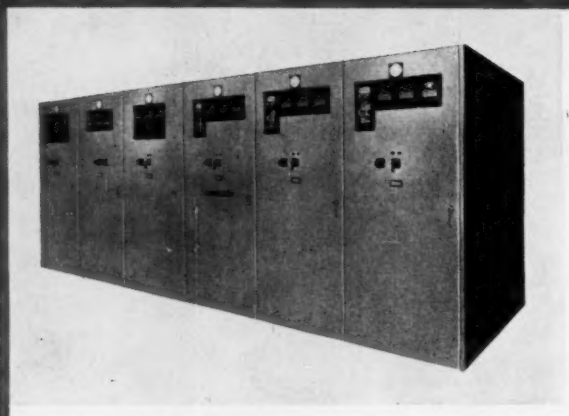
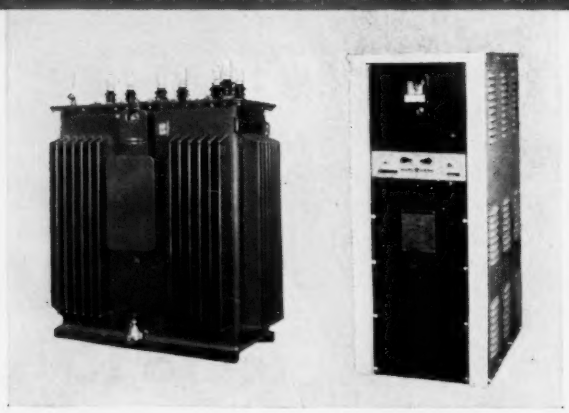
Designed to provide up to 96% efficiency, General Electric semiconductor power rectifier systems offer reliable, economical power conversion for the electrochemical industry

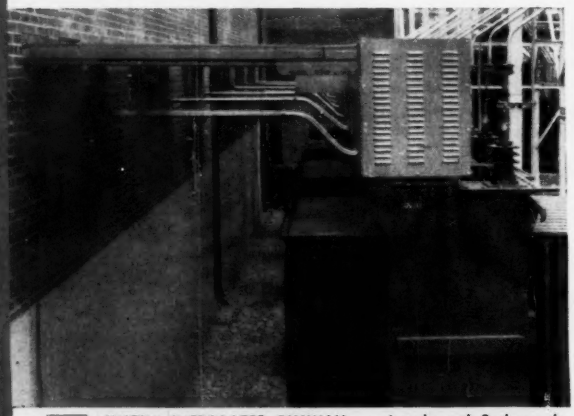
Typical General Electric Rectification System:



1 **SYSTEM COORDINATED** General Electric metal-clad switchgear equipment handles normal switching functions and provides dependable a-c short-circuit protection.



2 **LIQUID IMMERSED** (l.) or dry-type (r.) Inductrol® voltage regulators compensate for system regulation and a-c supply variations to provide d-c control at desired voltage levels.



4 **SYSTEM INTEGRATED BUSWAY**—an interleaved 3-phase design completes connection to rectifier. Busway provides greater flexibility . . . reduced installation costs.

5 **COMPACT, EFFICIENT** rectifier sections convert alternating current to direct current for process requirements. D-c current transformers, mounted on d-c buses, measure output.

In the last few years, General Electric has supplied semiconductor power rectifier systems for over 85 electrochemical installations. Users report that these systems—designed to provide over 90% efficiency above 15 volts d-c, and from 94 to 96% efficiency above 60 volts d-c—have increased system reliability and reduced installation and operating costs.

Coordinated System Components Provide Peak Performance, Longer Life—Because each electrochemical facility requires special d-c voltages for its particular process needs, power rectifier systems should be tailored to each installation for maximum reliability and economy. For this reason, General Electric manufactures all major power rectifier system components—including air-cooled and water-cooled, germanium and silicon rectifiers—and is fully equipped to provide installation and service assistance on all components.

G-E Semiconductor Power Conversion Systems Find Wide Application—Due to their greater efficiency and economy, General Electric rectifier systems have enjoyed widespread acceptance as d-c power sources in hydrogen, chlorine and fluorine plants; copper refining, aluminum reduction, tin-plating, chrome-plating and aluminum anodizing processes; and for powering d-c motors. New uses for these versatile dependable power conversion systems are continually being developed.

For Complete Information on General Electric *system-engineered* and *performance-proven* semiconductor power rectifier systems, contact your nearby General Electric Apparatus Sales Office. Your G-E sales representative can help specify semiconductor power rectifier equipment specifically tailored to your process needs.

Write G-E Co., Section 686-1, Schenectady 5, New York, for These Free Bulletins: GEA-6684, Semiconductor Rectifier Power Conversion Systems for Electrolytic Processes; GEA-6375A, Semiconductor Power Rectifiers.

Engineered Electrical Systems for the Electrochemical Industry

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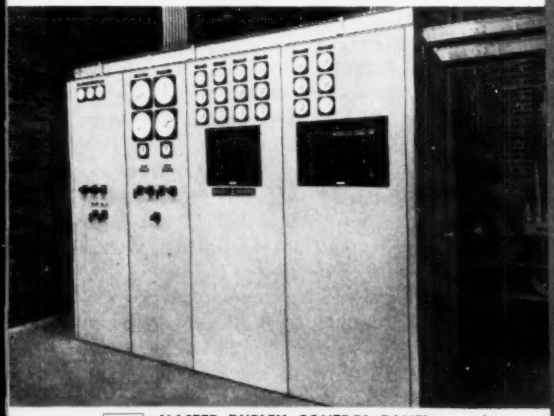
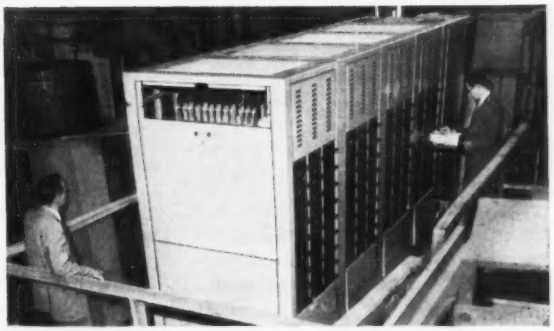
3 **G-E RECTIFIER TRANSFORMER** gives proper ratio of a-c primary to desired conversion voltage . . . can be located out-of-doors.

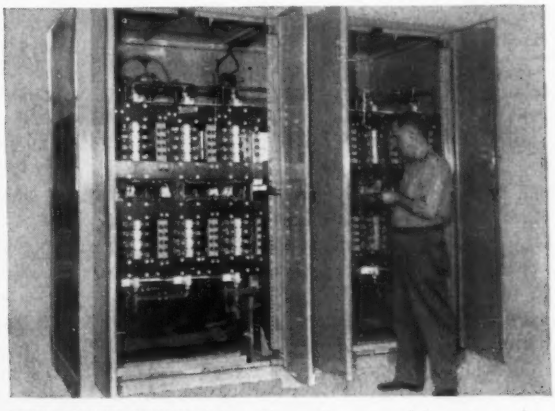


6 **MASTER DUPLEX CONTROL PANEL** provides centralized instrumentation and control of complete G-E power conversion system.

General Electric Offers Both Air and Water-cooled Rectifiers



G-E AIR COOLED semiconductor power rectifiers are recommended for systems where d-c voltages exceed 400 volts. Trays contain several series rectifier cell assemblies, fuse, fuse monitor and indicating lights.



DIRECT WATER-COOLED G-E rectifier units are used in systems where d-c voltages do not exceed 400-v. Internally mounted air-cooled transformers (above) are sometimes used in smaller systems.

Stimulated by the recession's "hard-sell", more firms have begun to "swap" business with their customers.

Reciprocity Smirks Behind the Sales Smile

By any name—"sales relations," "reciprocity," or "trade relations,"—the practice of "we'll-buy-from-you-if-you-buy-from-us" as a sales method is on the rise in the chemical processing industry. Generally, this reciprocity has been a "two-party" deal—but now management is becoming fearful of "three-party deals"—cases where customers try to name their suppliers' suppliers.

Most sales and purchasing executives attribute this upsurge to the recent recession. And while both groups are hopeful that improving business conditions will deemphasize reciprocal selling, opinions differ on how much the practice will lessen. Both sales and purchasing managements oppose reciprocity on general terms. In the face of such opposition, sales managers believe its growth is a "defense mechanism." Companies are forced to adopt the practice, if their competitors do. But opposition to reciprocity can be a matter of some interpretation.

Some distinguish between "reciprocity" and "sales relations." One purchasing agent puts it this way: reciprocity is a bareknuckled, crude attempt to force buyers to place business with their customers. Often the purchasing department has little decision-making influence in such cases.

"Sales relations," however, represents diplomatic, tactful negotiations between supplier and buyer with force elements "soft-pedaled." As such, purchasing agents find "sales relations" much more palatable than "raw reciprocity." But most, however, see little, if any, difference between the concepts—now becoming more a part of daily business.

Necessity's Spawn: Reciprocity selling began gaining ground several years ago with the end of shortages and "easy selling." Then, the recession's tough business conditions forced use of all sales tools. Reciprocity became almost a matter of "fair play." "It's only right," one sales director told *CW*, "to expect your suppliers to help you weather the storm."

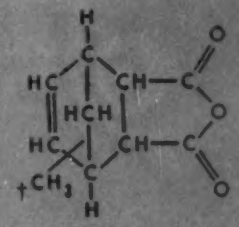
But the recession isn't the only reason for the rise in this "trade relations marketing." Partly, it comes because companies now tend to emphasize large-volume accounts. This trend naturally leads to closer liaison between top-level buying and selling executives and their keener awareness of their interdependence.

Improvements in data processing (such as integrated data processing systems) are also a factor, have made trade relations information much more available.

Concentration: It's hard to generalize about the areas where reciprocity is most common. Chemical purchasing agents report that they encounter it frequently: some sales executives,

From National Aniline Research

METHYL NADIC® ANHYDRIDE



† the methyl group replaces one of the hydrogens

3 Easier-to-Use CURING AGENTS FOR EPOXY RESINS*

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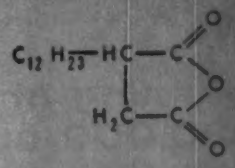
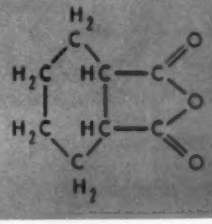


HEXAHYDROPHTHALIC ANHYDRIDE



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Planning ahead can save $20,000 on fluid mixing

An idea from your LIGHTNIN *Mixer representative's briefcase*

This engineer is listening to an idea that's going to save his company $20,000 on fluid mixing.

He's working on a process that will employ mechanical mixers. But in a year or so, process requirements are expected to change, throwing 15% greater load on the mixers.

Problem: how can he anticipate this change *now?*

Solution proposed by LIGHTNIN Mixer representative: install standard turbine-type LIGHTNIN Mixers geared for the immediate job, but sized to handle the expected load.

When requirements increase, simply change impellers and two gears in each mixer—providing correct power input for the new conditions at minimum expense.

What this man can do for you

This is one example of the many ways your LIGHTNIN representative can help you get efficient fluid mixing at lowest long-term cost.

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In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

however, find the opposite. But despite this disagreement, most feel that the petroleum, paper, rubber and, now, the paint and protective coatings industry are the most avid practitioners of the art. Moreover, reciprocity is usually employed only for large accounts.

Most *CW* sources report little contact, as yet, with three-party deals.* But just how fast this situation will develop is hard to gauge. "Three-party deals" face three principal obstacles:

- Administration. It is difficult to really know the raw material requirements of the second company, that would be supplied by the third party.
- Approach. Because of a three-way rather than a two-way element of trading exists, the "second and third parties" may be more likely to resent pressure. This calls for an extremely skillful sales approach.
- Cooperation. Success of "third-party" sales relations depends upon cooperation of the middle or second party—often difficult to obtain because the second party fears reciprocity will endanger its own sales.

Reciprocity Downturn? Will improving business conditions reduce reciprocity selling? Although some sales managers and purchasing agents say "yes," many expect that, at best, an upturn will only stabilize reciprocity practices. As one sales manager puts it, "it's here to stay."

Main reason why no real decrease is expected: most arrangements have some validity other than reciprocity alone. Most companies will accept reciprocity only if purchase is desirable from other criteria. These criteria often remain after a recession disappears. The recent trend toward establishment of "Sales Relations Directors" and "National Account Departments" as part of sales management organization also points to the permanence of the trend.

Varied Attitudes: Buyers bristle when sales departments attempt to sell on a "force basis" alone. They see reciprocity as negating the importance of professional purchasing, of service, price, delivery and other standard means for choosing suppliers. Particularly objectionable, they

*A "three-party deal" often refers to this situation: Company A purchases large quantities of material from Company B. Company A sells to a third party—Company C. Company A uses its influence with Company B to encourage B's purchase of materials from C.

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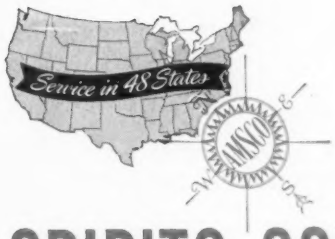

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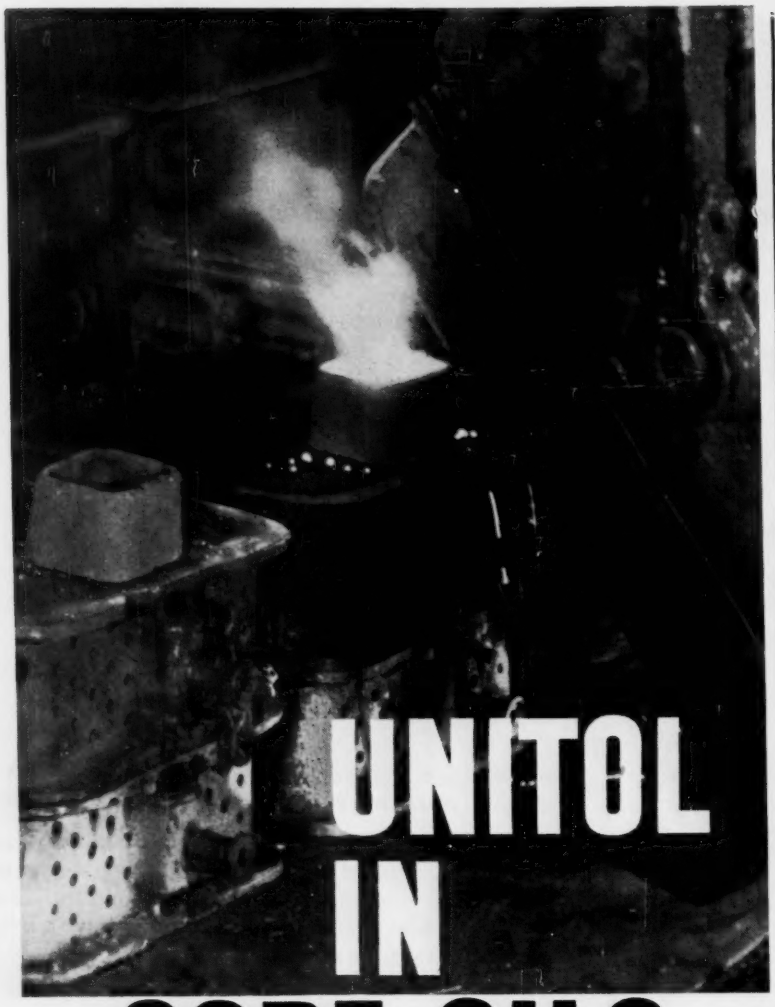

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say, are attempts to "trade business on a dollar-for-dollar basis." In cases where a purchasing agent's company may only be buying a few thousand dollars' worth of a product from all suppliers, it may be selling many times that figure to several. Reciprocity in such instances is impossible and the p.a. must persuade the supplier to be satisfied with a fair percentage of the business. "It takes a strong p.a.," one buyer says, "to do that."

Although opposed in principle, many purchasing agents recognize that reciprocity is acceptable—and even desirable under some circumstances. "Proper use" of reciprocity arises where there is a sincere intention to "help those who help you." Under such conditions it can lead to fuller exchange of ideas, information and more mutually advantageous contracts. Reciprocity, they add, must be handled only by top management.

Sales management also believes that reciprocity is a top management matter—often forbid salesmen to discuss it.

Cool Reaction: Sales management also takes a critical view of reciprocity—sometimes even in cases where it works in its favor. Biggest objection: reciprocity can hurt as well as help. Trade balances between companies can and do change. The company with an "advantage" today can, by a change in market conditions, product lines or mergers, be at a disadvantage later.

On fundamental principles, sales managers oppose reciprocity because it decreases sales professionalism—it tends to make sales staffers mere order takers.

Another reason for their coolness may be that, although they can't use it as a sales tool themselves (top management handles it), they must often sell against it.

In some cases, reciprocity can pose severe problems. That's especially true with vertically integrated companies who have little chance to "reciprocate" by buying raw materials.

These attitudes—as is reciprocity itself—are influenced by the general climate of business. Seemingly, since both buyers and sellers prefer not to engage in reciprocal selling, better business-in-general should keep the practice from going much further. More particularly, it may well stem any real growth of the current problem and three-party reciprocal selling.

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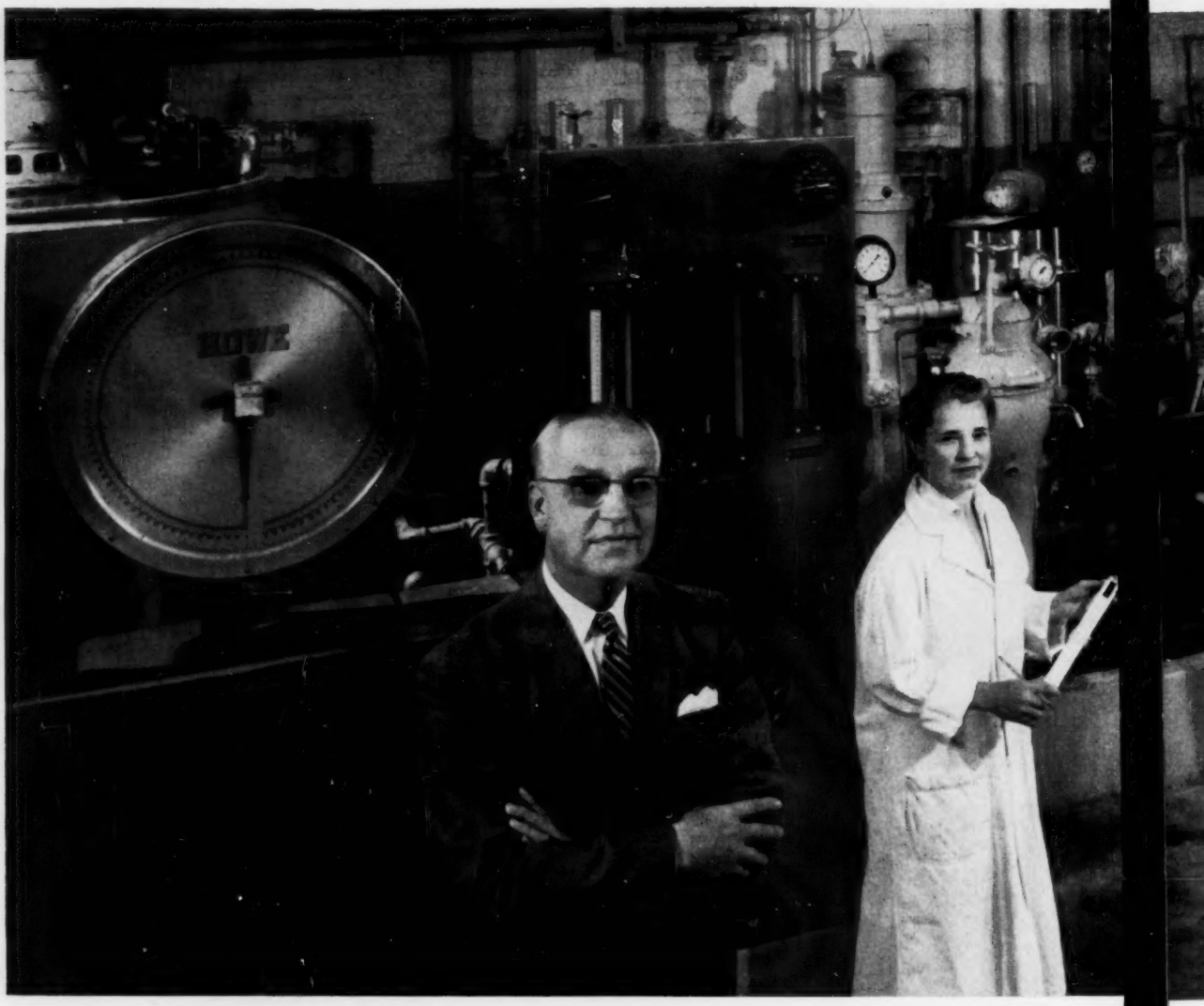

"De Laval's pilot plant simulates your process conditions to solve centrifugal processing problems."

Fred Wheelwright, De Laval Separator Company

"The photograph above shows the major portion of De Laval's pilot plant setup at our Poughkeepsie, N. Y., headquarters . . . and some of the key people responsible for its operation.

Basically, what we provide here is a complete centrifugal processing facility in which you can test your processes without having to build your own pilot plant. We find the answers to problems concerning separation, clarification, classification or concentration of liquid-liquid-solid or liquid-solid mixtures. These findings are then applicable to the operation and/or construction of your own process facilities.

Facilities: Our plant has the capacity to handle samples in reasonable production quantities. It has stages for mixing, reaction, heating and three stages of separation . . . followed by a continuous high vacuum dryer. Most of the equipment is stainless steel to permit us to handle corrosive liquids. We've found very few situations in which we could not simulate process conditions well enough to give an accurate reading on process efficiency or feasibility.

Examples: We've done work here for many of the country's leading chemical companies. Typical examples of the problems we've handled are:

- removing oversize particles from polyvinyl latex.
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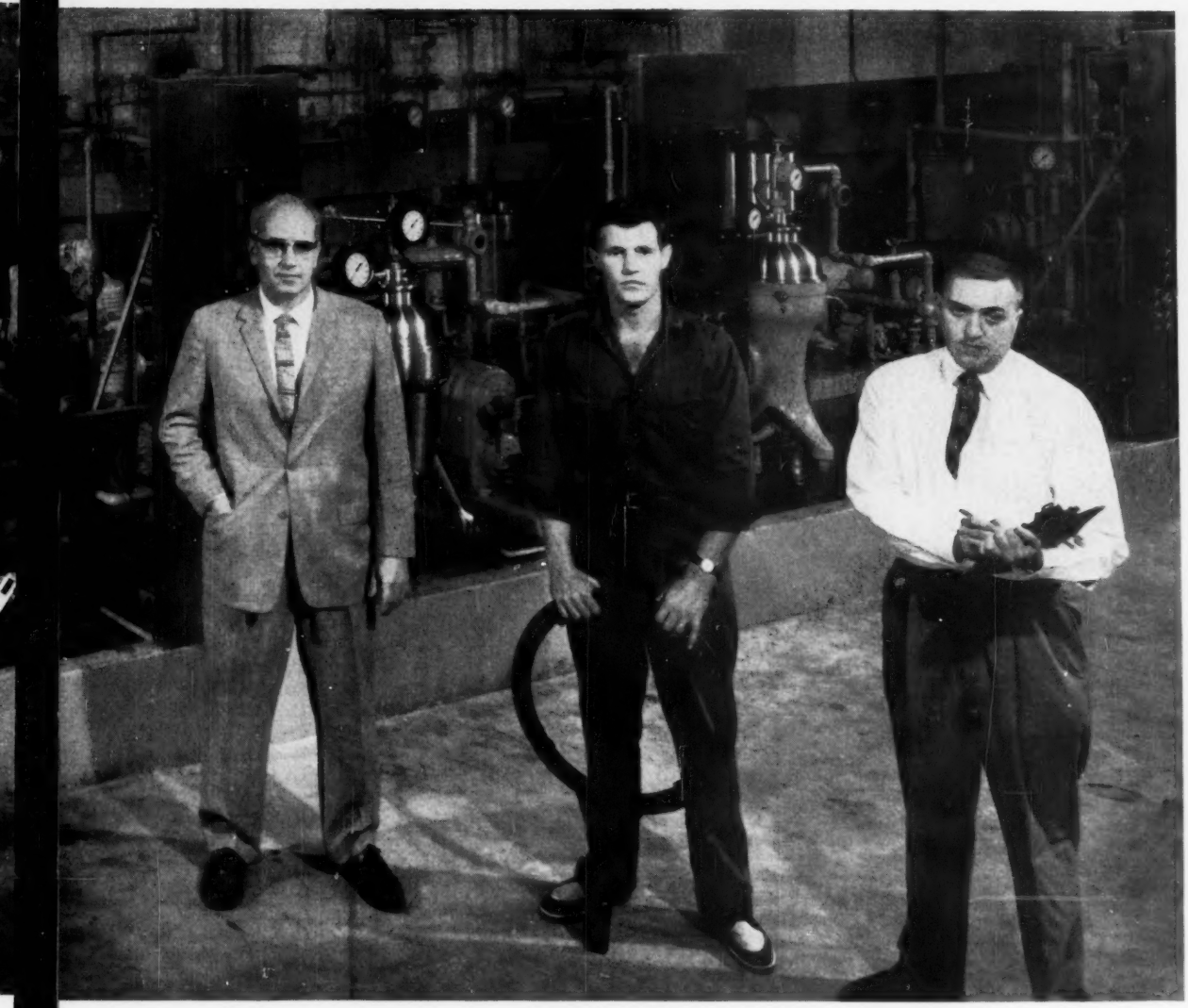
- removing catalysts from re-arranged lard.



And one of the best-known products of this pilot plant is the patented De Laval tall oil process. The patent on this continuous acidulation process (full information on request) is based on work done here by our Manager of Industrial Engineering, Frank Sullivan.

Personnel: In the center of the picture: Frank Sullivan, B.Ch.E. at N.Y.U., and a Master's at Stevens Institute . . . one of the country's foremost authorities on centrifugal processing, has published many papers on various aspects of centrifugal technology. With De Laval since 1950, Mr. Sullivan is responsible for the engineering development of all De Laval's industrial equipment and processes, and for the industrial laboratory and process laboratory.

Next to Mr. Sullivan is Mrs. Lois Crauer, B.S. degree from U. of Rochester, a member and active in the A.C.S. and A.O.C.S. Undoubtedly one of the best-known authorities (and certainly one of the prettiest!) in the field of vegetable oil processing, Lois Crauer's work at De Laval places particular emphasis on development of chemical processes.

At the far right of the picture is Victor Lindenman, Jr., Chemical Engineer (Northeastern University) responsible for direct supervision of the pilot plant. Between him and Mr. Sullivan is Lowell Signor, Jr., Test Man responsible for operation and maintenance of the pilot plant equipment. And that's me, Fred Wheelwright, on the left.

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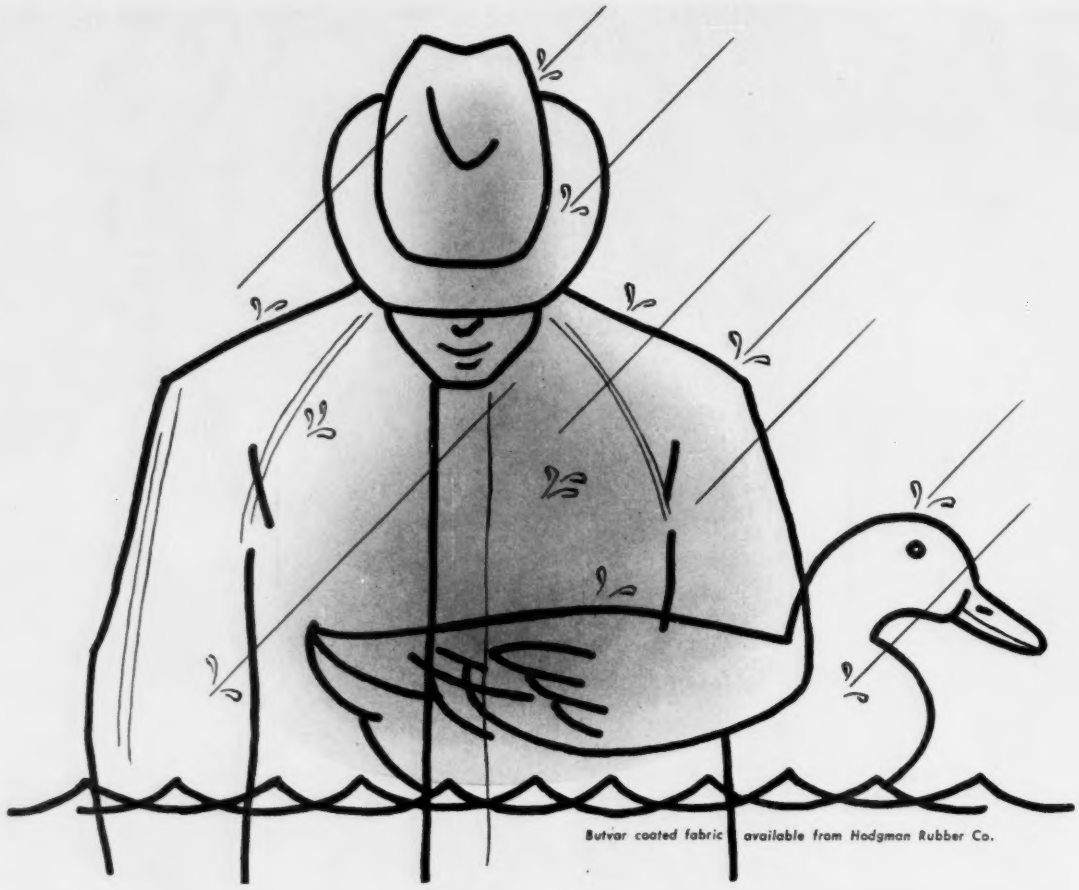

Butvar coated fabric available from Hodgman Rubber Co.

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Shawinigan Resins' Butvar (polyvinyl butyral) is the primary ingredient in water-proof coatings for high-style rainwear. On virtually any natural or synthetic fabric, the Butvar coating — tough, flexible and lightweight — enhances the hand and drape. The coating is impermeable to moisture — even under pressure — yet will transmit moisture vapor, thus assuring comfortable, durable rainwear. Because of these outstanding qualities, the U.S. Army has adopted Butvar coated nylon for dress raincoats.

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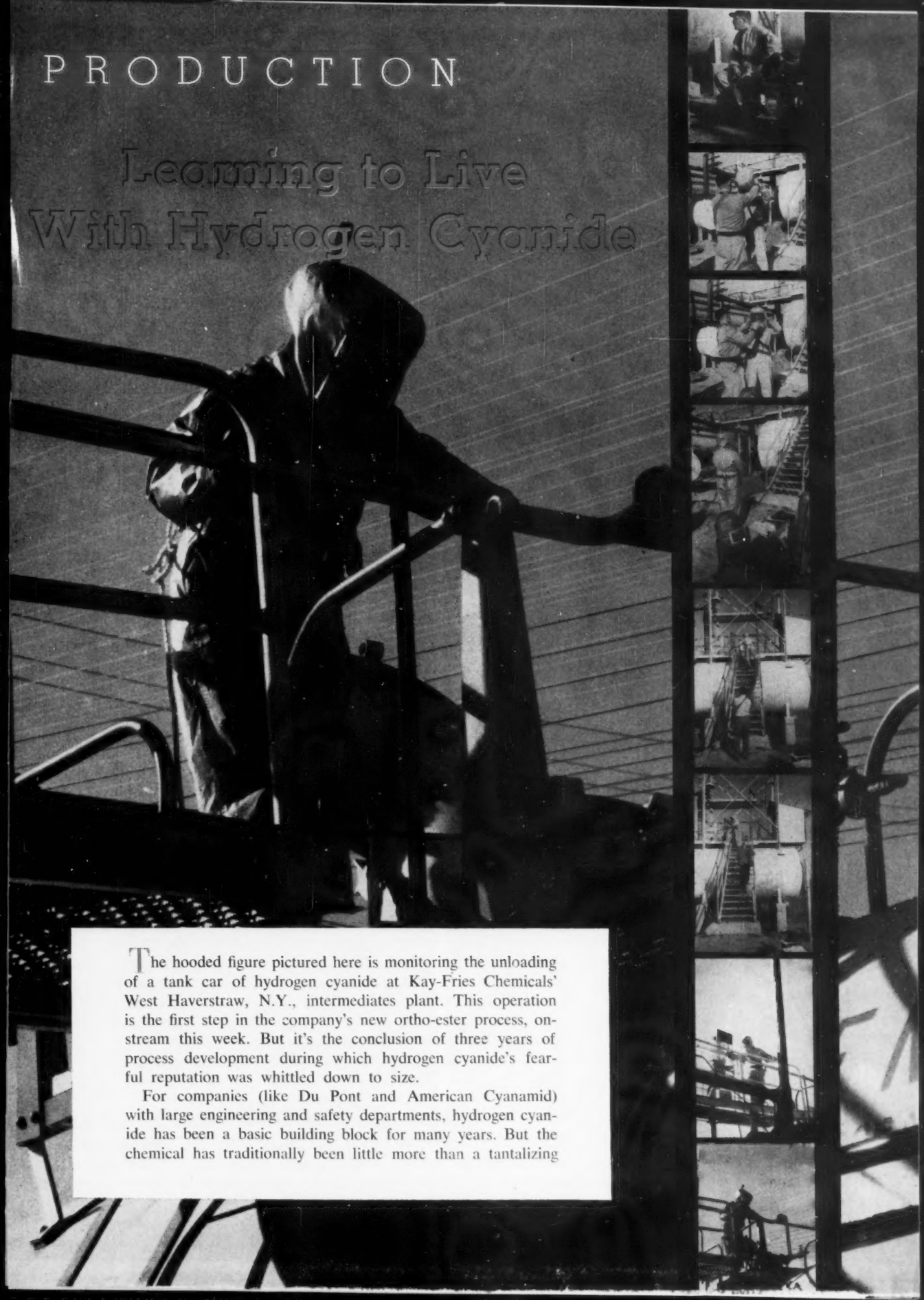
PRODUCTION

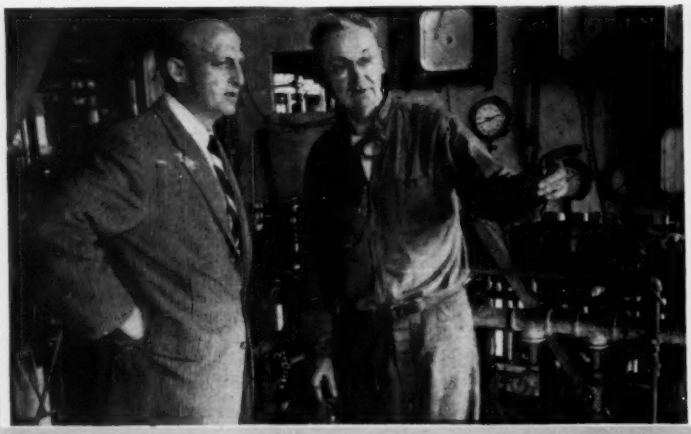
Learning to Live With Hydrogen Cyanide



The hooded figure pictured here is monitoring the unloading of a tank car of hydrogen cyanide at Kay-Fries Chemicals' West Haverstraw, N.Y., intermediates plant. This operation is the first step in the company's new ortho-ester process, on-stream this week. But it's the conclusion of three years of process development during which hydrogen cyanide's fearful reputation was whittled down to size.

For companies (like Du Pont and American Cyanamid) with large engineering and safety departments, hydrogen cyanide has been a basic building block for many years. But the chemical has traditionally been little more than a tantalizing

Many Questions and Answers



'Are there special rules for the new plant area?'
'A list of rules for operators of the new unit is available to any plant worker who will require it.'

'Will I be able to detect hydrogen cyanide?'
'Yes. You can smell 1-2 ppm. in the air; 10-20 ppm. is the maximum allowable concentration.'

'What special safety equipment must be worn?'
'A special suit is worn for unloading the tank cars; gas masks are satisfactory for an emergency.'

'How great is the danger to other plant areas?'
'The area is isolated; danger is no greater than that presented by the other hazardous plant areas.'

CW PHOTOS—TONY & HELGA CHAPELLE

Safety Director Winfield trudges toward plant during daily safety rounds. He has just checked hydrogen cyanide car unloading *(background)*, warned the young pheasant hunters *(on tracks)* to keep away from area. Next: answering workers' queries *(below)*.

Put Story Across

'Will continued contact cause toxic buildup?'
'No. The body rapidly breaks down small amounts of the gas into compounds that are harmless.'

'Is equipment for detecting the gas available?'
'Equipment that accurately detects 2-4 ppm. of hydrogen cyanide in air will be in routine use.'

Winfield explains unloading operation to employees seeing it for first time.

possibility to smaller firms—particularly one like Kay-Fries, already making cyano-group intermediates (i.e., cyanoacetic acid and ester, cyanoacetamide) from less hazardous sodium cyanide. As a result of its availability in tank-car lots, hydrogen cyanide is a highly attractive starting material and a wedge for broadening the company's product range.

Asset in Size: Once the decision to use hydrogen cyanide was made, smallness proved an asset to Kay-Fries. It was most pronounced in the safety education program.

Safety Director Holt Winfield, an 18-year Kay-Fries veteran who doubles as instrument engineer, is able to make at least one, and more often two, rounds of the plant each day. His close personal contact with the 150 plant and office employees allows relaxed discussion of the project.

Hydrogen cyanide boils at 78 F; 10-20 ppm, is the maximum allowable concentration in working areas; 0.3% in air is soon fatal. "Actually," says Winfield, "the facts aren't as bad as you might think. You can smell it at very low concentration, and even a good whiff of it isn't fatal—provided that oxygen is administered immediately. My job was to present the facts," he says.

Over a period of more than two years, Winfield answered slews of questions *(see left)*. The only formal meetings were for the new plant's operators, stressed safety and first

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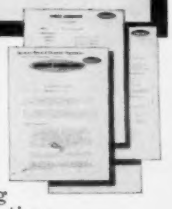

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Chief Engineer Ed Opdyke (pointing) discusses design with his staff.

aid. And many interested employees watched the first car unloaded—despite a driving rain.

First, Made Sure: At an early stage, Du Pont and Kay-Fries personnel discussed plant location—its proximity to residences, prevailing winds. The plant's safety and housekeeping programs, and engineering talent were also scrutinized before it was agreed that Kay-Fries could handle hydrogen cyanide with needed safety. And Ed Opdyke, the chief engineer, visited Du Pont's hydrogen cyanide operations for on-the-spot observation.

Result: the project proceeded smoothly. And as William P. Bitler, executive vice-president, sums it up: "We'll always have a healthy respect for hydrogen cyanide; but now, it's just another part of plant routine."

New unit (arrow) is in isolated area; winds sweep toward the river.

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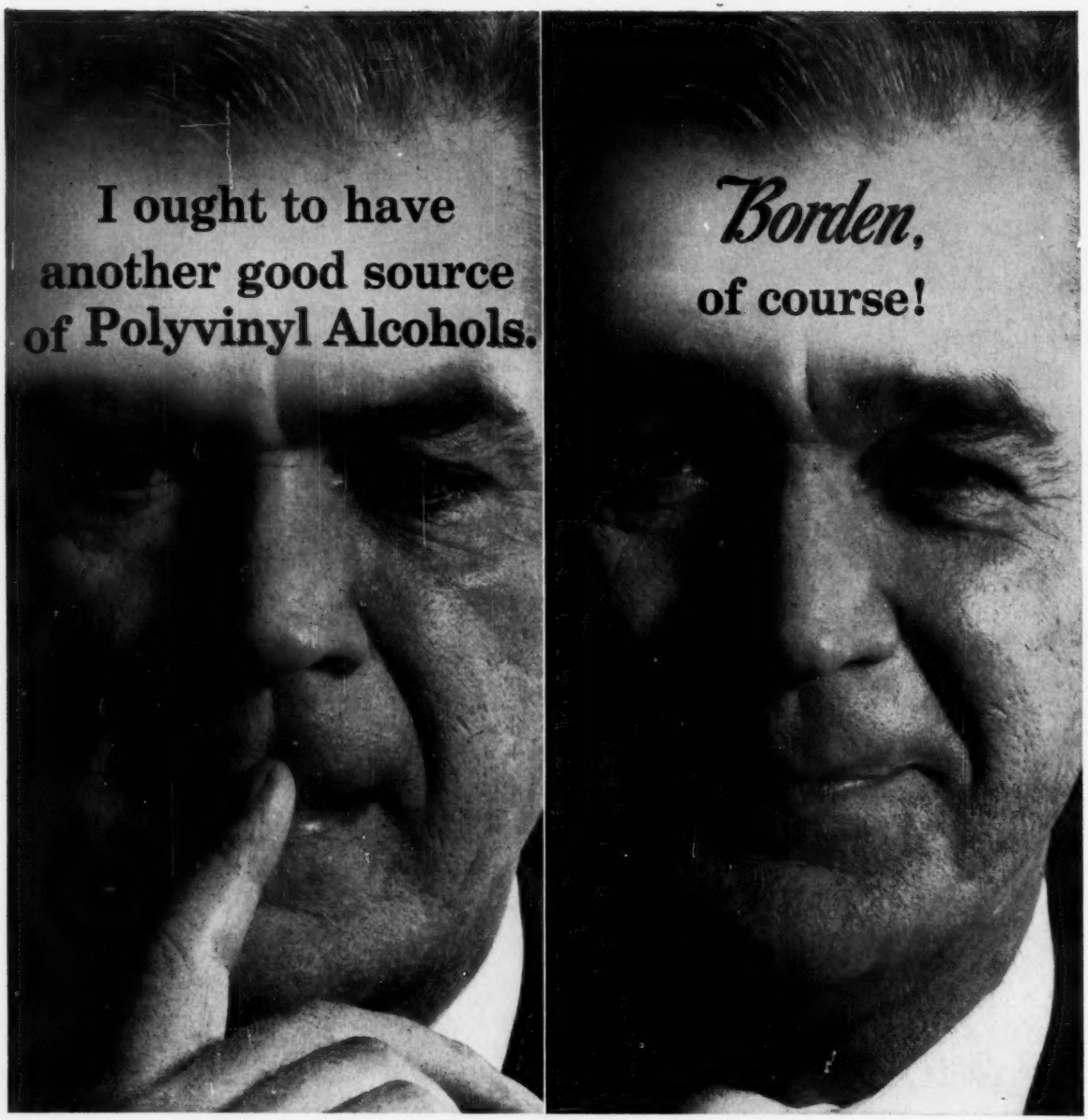

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Researchers are getting increased play in advertising, press releases, house organs.

Does It Pay to Publicize Researchers?

Does it pay to publicize individual researchers? A just-completed CW study shows that increasing numbers of chemical companies think it does: that it improves employee morale, builds a desirable corporate image, simplifies recruiting, even boosts sales. But there are still sharp differences in the aim and extent of publicizing individuals, and how best to go about it.

The conventional way to draw attention to the accomplishments of an individual is, of course, the press release. But The Texas Co.'s (New York) recently initiated method of using press handouts to publicize the researchers responsible for each of its new patents — releases that emphasize their professional and academic attainments — is probably a step ahead of the individual publicity efforts of most companies in the CPI.

Perhaps more typical in the way they handle their researchers' triumphs are California Research Corp. (San Francisco), a division of Standard Oil Co. of California, and Union Oil Co. of California (Los Angeles). CRC simply posts notice of patents on company bulletin boards, along with other employee notices. And Union says flatly, "Our business is a team effort. We do not believe in individual exploitation. If we publicized the activities of our researchers, we'd have to do the same for all personnel."

Organizations that are predominantly research groups, such as Bell Telephone Laboratories (New York), do not share this problem, can go after outside publicity for their researchers. While Bell does not issue patent releases in the Texaco manner, it does put out releases on new lab-

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oratory work, including photographs of key men involved.

Armour Research Foundation-Illinois Institute of Technology (Chicago) also works hard at publicizing its staff, but some reports are excepted, for much of its work is cloaked in security regulations of either government or industrial sponsors.

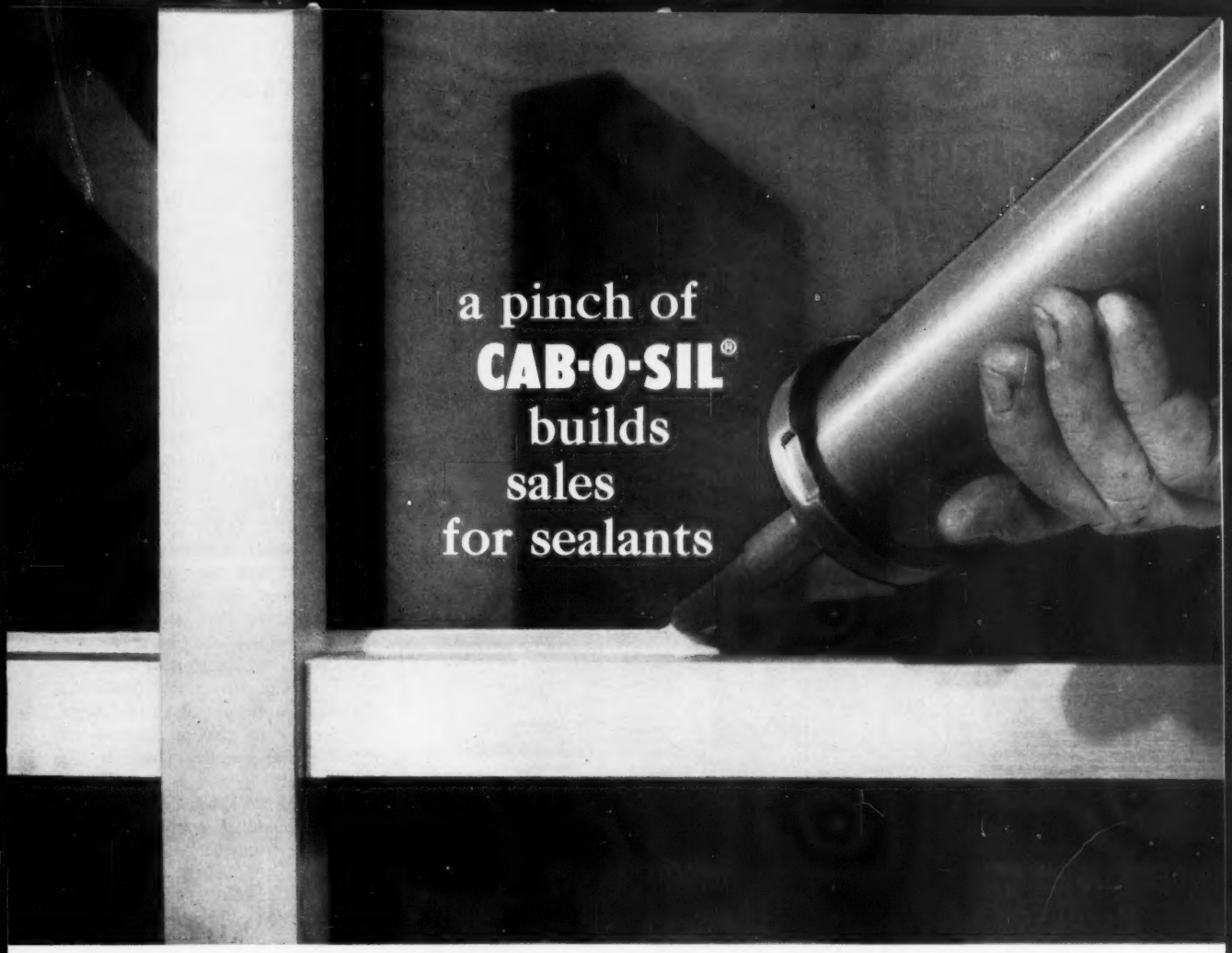
In the middleground, Hooker Chemical Corp. (Niagara Falls, N.Y.) adheres to a policy of releasing bare information on new patents (number, title, inventors and their position), considers biographies irrelevant and supplies the addresses of patentees to local papers only.

Room for Promotions: Some companies that steer clear of publicizing individual patents don't hesitate to issue releases on promotions, awards or publications. Hercules Powder Co. (Wilmington, Del.), for example, won't talk about patents but thoroughly covers promotions of its research people. Also, in its employee publication, the *Beacon Rocket*, Hercules discusses appearances of its researchers before national meetings, changes in assignments, articles written in scientific journals, and includes short biographies and pictures of new research personnel. Detailed accounts of other company research (e.g., development of polypropylene) appear occasionally in the firm's monthly magazine, *The Mixer*.

Standard Oil of Indiana (Whiting) likewise avoids mentioning the individual's role in discoveries—mainly because it's difficult to single out the most deserving staffers in team projects. Instead, the firm says it believes in showing its appreciation by raising salaries and passing out promotions. But it does issue news releases on personnel who receive awards from scientific societies and who present papers at conferences and meetings. Similarly, Vitro Corp. of America (New York) issues releases on publications and promotions, often providing technical assistance in the preparation of the publications by its staffers.

United States Borax and Chemical Corp. (New York) confines its releases to shifts in high-level personnel — whether in research or other departments.

It Pays to Advertise: In recent years, individual researchers have been appearing more frequently in com-



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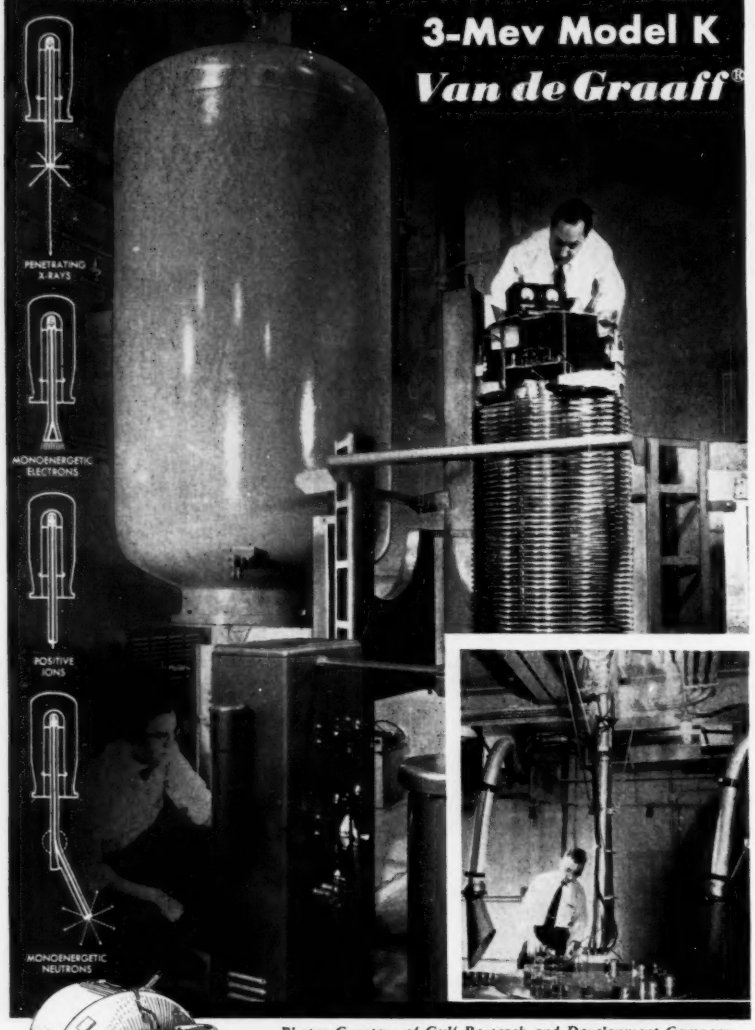
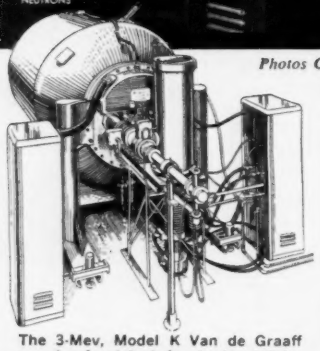
( ) A Flatting Agent for Varnishes (#cpai-3)
( ) Cab-o-sil in the Reproduction Paper Industry (#cpap-1)
( ) Cab-o-sil in Polyester-Glass Reinforced Plastics (#cpla-1)
( ) Cab-o-sil in the Plastics Industry (#cpla-2)
( ) Cab-o-sil in Automobile Polishes (#cpol-1)

Versatile Research Accelerator

3-Mev Model K *Van de Graaff*®



Photos Courtesy of Gulf Research and Development Company



The 3-Mev, Model K Van de Graaff can be furnished for horizontal installation as illustrated above.

Write our Technical Sales Department for more information on the Model K, 3-Mev Van de Graaff.

This powerful multi-particle accelerator — proved in the field — is the basic tool for a broad program of fundamental or applied radiation research.

Now in use for: nuclear physics, radiation processing, polymerization, radiation chemistry, reactor engineering, sterilization, radiation damage, biology, particle injection, radiography.

ELECTRONS: 1 microamp to 1 milliamp.
X-RAYS: 900 R per minute at one meter. (Equivalent to 20,000 curies of Co-60).
POSITIVE IONS: 10 to 200 microamp.
NEUTRONS: 6 x 10^{11} neutrons per amp.
Voltage and current output are stable, precisely controlled, and continuously variable.

HIGH VOLTAGE ENGINEERING
CORPORATION
BURLINGTON MASSACHUSETTS

RESEARCH

pany advertising. Object of such advertising may be for either recruiting or prestige purposes (e.g., Bell Telephone Laboratories' "institutional" ads) or it may smack of hard sell Callery Chemical Co. (Pittsburgh, Pa.) has made notable use of the technique to promote interest in its new boron compounds (*see advertisement, CW, Nov. 15, p. 99*).

Weyerhaeuser Timber Co. (Tacoma, Wash.) and Ansul Chemical Co. (Marinette, Wis.) have also featured lab men in ads. Ansul has this year departed from its policy of picturing individuals in its ads, but says that its advertising campaign for next year is not complete, and "we are thinking seriously about continuing the theme of personal skill and integrity among Ansul people. Our management sincerely believes that people are the real competitive difference between companies, and we want to reflect this belief in our advertising. Individual achievement means a lot at Ansul, and we try to give recognition and praise in full measure whenever it is due."

Government's Lead: Companies lagging in researcher publicizing might take a leaf from the book of governmental agencies such as the U.S. Dept. of Agriculture, which has one of the nation's largest aggregations of scientists and, in addition, one of the largest publicity staffs. Its policy is always to name the men responsible for USDA research achievements. In the last few years, USDA has been increasing budget and staff for its publicity arm.

Conservatively, National Bureau of Standards also claims a "deliberate and conscious policy of giving credit to our own people in reporting on scientific developments and programs." NBS feels this policy has helped boost morale and helped in recruiting graduates who feel their accomplishments will be recognized in the same way.

The National Science Foundation, while employing relatively few scientists, does make grants-in-aid to thousands of scientists for basic research. Its policy, too, is to draw public attention to their achievements — primarily to promote general understanding of the importance of their work.

Long and Short: Few researchers are distinguished on film or on the dedication plaque of a new labora-

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU

Nopco detergents insure important economies

. . . **IN TEXTILES** *they add important economies in wool scouring and carbonizing, cotton boil-off operations, and dyeing*

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. . . **IN TANNING** *they are used in hair scouring and to remove excess hide grease*

. . . **IN ANY PRODUCT** *where a surface cleansing action is desired*

Nopco chemists are constantly spurred by the need for practical chemistry in industry—for new and better ways to overcome processing problems our customers face. The success of our business over the years has been built largely on their unfailing success in finding the exact answer. Why not let Nopco chemists have a try at your most urgent present problem—in the selection or use of detergents or anything else where practical chemistry can serve. Simply write or call our Technical Research Department. Nopco Chemical Company, Harrison, N.J.

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For complete information, see Chemical Materials Catalog, Page 378

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Particularly recommended for its properties as a reducing agent, preservative, antichlor and pH control.

Tennessee's Liquid Sulfur Dioxide is practically 100% pure.

This versatile chemical of so many uses can be very efficiently and economically used in various production processes. Tennessee's Liquid Sulfur Dioxide can perhaps be utilized to advantage in your processing.

We would like to discuss with you the possibilities of Tennessee's Liquid Sulfur Dioxide in your processing.

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Available In:
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RESEARCH

tory building. Two recent occasions in which signal honors were bestowed: Archer - Daniels - Midland recently made a color sound movie on paint-making (for club, promotional showings) in which only one professional actor appeared, among a cast of ADM researchers. And Sylvania Electric Products Inc., dedicated its new chemical and metallurgical division research and development laboratory at Towanda, Pa., to John Merrill, former vice-president (and fluorescent powder research physicist) who was killed in a plane crash.

Some companies will continue to be ultraconservative on publicity, to avoid competition for their ideas or for their personnel. In the long run, though, it looks as if there will be increasing emphasis on telling the public more about the individuals behind industry's technological gains.

EXPANSION

- United States Steel Corp. (Pittsburgh) is operating a new chemical laboratory at its Clairton Works (coal chemical hydrogenation unit).
- L. Sonneborn Sons Inc. (New York) has expanded its Nutley, N.J., engineering laboratory (Building Products Division). It now functions as a clearing house for technical information in the building products field, is also engaged in testing concrete, sealing compounds, surface treatments, corrosion inhibitors.
- Consolidated Water Power and Paper Co. (Wisconsin Rapids, Wis.) will construct a $200,000 research and development laboratory.
- Flexonics Corp. is building a laboratory at Elgin, Ill., for its new Flexonics Research Laboratories Division. The division will provide testing and development service on a contract basis to government and industry. The firm has been researching chemical and metallurgical studies on special alloys and new metals.
- Materials for Electronics, Inc. (Jamaica, N.Y.), has been organized to supply special-purpose chemicals, metals, ceramics, minerals and components to the electronics industry.
- Aluminum Co. of America (Pittsburgh) will construct a research and development center at Merwin, Pa., eight miles east of the present Alcoa laboratories. No construction date has been set. Alcoa will spend $18 million in R&D efforts this year.

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A hardener for softer polyethylene and oxidized micro-crystalline waxes.

A complete replacement for natural waxes.

A hard, readily emulsified, pale colored wax.

Shanco W-1119 will give you what you are looking for. W-1119 is a basic product, a prime material which is meeting the exacting engineering standards of today's industry.

Shanco W-1119 gives maximum uniformity, high melting point, low penetration.

Shanco W-1119 is an emulsifiable Fischer-Tropsch wax.

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Plastics & Chemicals Inc.
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"NOSEY" says:

I'VE got a hunch that lots of folks who **could** apply odorants with advantage to their product, or at some stage of its processing, avoid doing so because they're just downright timid. The very thought of getting themselves involved in the use of complex aromatic chemicals scares some of them off, I'm sure. 'Course they don't **have** to know anything about chemistry to use these materials effectively. FRITZSCHE'S Industrial Odorant Laboratories will supply the know-how and the help that's needed. All anyone interested need do is brief FRITZSCHE on his particular product and let their experts carry the ball from that point on. Now, what do you say? Isn't there a place in your business where odorants or deodorants may be used to advantage?

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Established 1871
PORT AUTHORITY BUILDING
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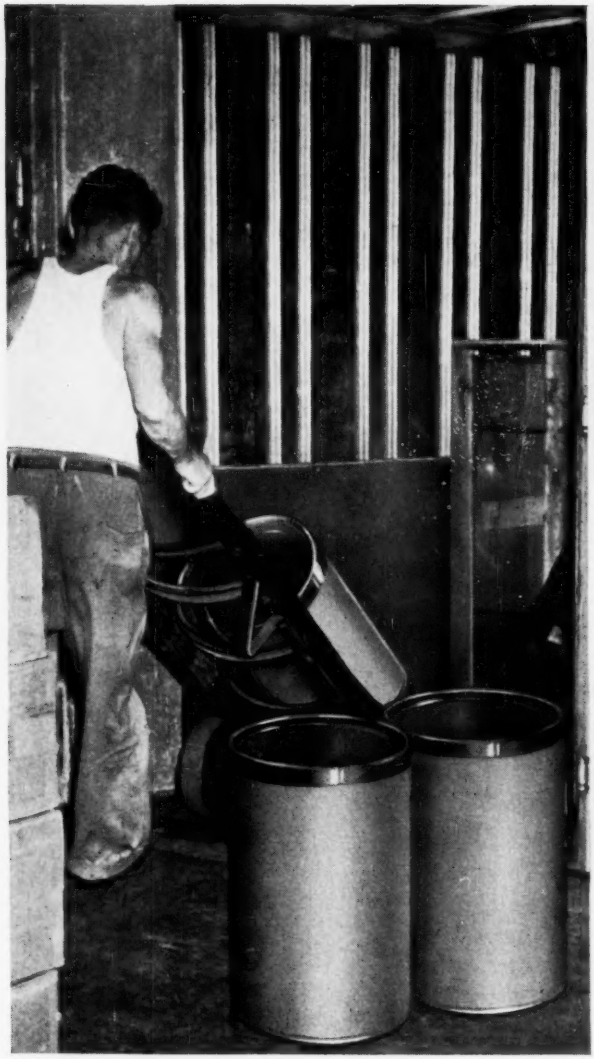

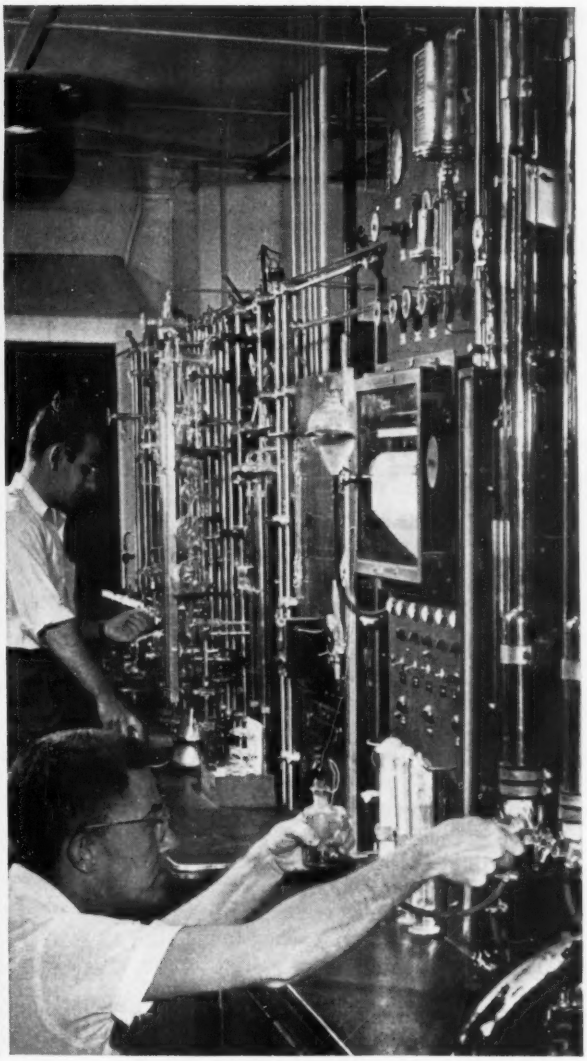

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If you need a better way to make your present product—or to develop a brand new product for a new market, Texaco's technical service can help you solve the problem faster.

Your process problem may be one of those that Texaco has already solved. If not, Texaco has the facilities and the know-how to come up with a prompt solution.

Texaco can help you use and handle ammonia more effectively and more profitably—and you can depend on it that the ammonia available from Texaco's new facility at Lockport, Ill., is always in abundant supply and will be delivered to meet your own schedule.

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AA Quality Chemicals

AA Quality Sodium Fluoride helps a nation protect its children's teeth

WITH water fluoridation test regions showing as high as 65% reduction in dental decay, AA QUALITY Sodium Fluoride provides low cost protection for our children's dental health (only a few cents per person per year!) Made under exacting chemical controls, AA QUALITY Sodium Fluoride is 98% pure, imparts no taste, odor or color to the water.

AA QUALITY Sodium Fluoride is also used in the production of rimmed steel. Reacting with the "pour" in the ingot forms, the *uniform, high-quality* chemical reduces viscosity of the non-ferrous elements so they are carried to the surface of the molten metal with escaping, entrained gases for easier, more thorough separation.

For further information about AA QUALITY Sodium Fluoride or any other AA QUALITY Chemical, please write to our Research Department on your letterhead. Data sheets and free samples will be furnished gladly.

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Disodium Phosphate • Trisodium Phosphate
PHOS-FEED® BRAND Dicalcium Phosphate

PHOSPHORIC ACID
85% N.F. Grade • 75% Pure Food Grade
50% Pure Food Grade
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All grades Florida Pebble Phosphate Rock
Superphosphate
Complete Fertilizers
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Magnesium Silicofluoride
Potassium Silicofluoride
Sodium Silicofluoride
Zinc Silicofluoride
Silicofluoride Mixtures
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GELATIN
KEYSTONE® Gelatin: Edible, Photographic Pharmaceutical, Technical

OTHER PRODUCTS
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Bone Black Pigment (COSMIC® BLACKS)
Bone Ash
Bone Oil
Keystone Ammonium Carbonate
Sulphuric Acid

Technology
Newsletter

CHEMICAL WEEK
November 22, 1958

A "one-shot" mixing method that simplifies "flexible" urethane foam making was revealed by Mobay Chemical Co. (Pittsburgh), this week. The method, the company reports, will eliminate much of the pre-polymer mixing of components and simplifies curing requirements. Key: a new combination of catalysts featuring an organotin compound for stabilization. Other components of the catalysts are believed to be a fast-acting amine (e.g., triethylene diamine) and possibly an iron compound.

Mobay last week sent details of the catalyst system to major polyether urethane foam manufacturers who will study the system further to see whether it can be adapted to large-scale use.

Other companies have been researching "one-shot" systems—Du Pont and Allied along with Mobay in the isocyanate field; Carbide, Wyandotte and Dow in polyethers. The problem is difficult because of the critical balance of catalyst activity required—reaction takes place in the mold, is hard to control. In the pre-polymer system, the reaction can be controlled before pouring into the mold.

But the others may not be far behind Mobay. Allied's National Aniline Division reports that it hopes to perfect its one-shot system during the first half of '59. Houdry Process Corp. (Philadelphia) has been suggesting its triethylene-diamine foaming catalyst, Dabco, for polyether systems for some time (*CW, Oct. 8, p. 68*). These catalysts are believed to bring the cost of one-shot foam-making down from about $10/lb. to about $3/lb.—comparable to pre-polymer methods.

But one-shot methods may not be the final answer. Wyandotte, for example, reports that although it has successfully made one-shot flexible foams based on its polyethers, it will continue to work on techniques for those who prefer the pre-polymer route.

•

Tranquilizers in animal rations Ciba's Serpasil brand of reserpine—used as a tranquilizing and antihypertensive agent in humans—has been cleared for sale as an animal feed additive by the Canadian Food and Drug Directorate. Ciba is now awaiting similar approval of the drug by the Food and Drug Administration in the United States. As a livestock feed supplement, the reserpine will be marketed in 0.8% concentration in soybean flour.

•

Gibberellins are boosting cotton yields up to 20% in West Texas and California field tests, according to a report this week by James Merritt, manager of plant products development for Merck & Co. Merritt told the Carolinas-Virginia Pesticide Formulators Association, meeting in Pinehurst, N.C., that Merck's Gibrel brand of the plant growth stimulator "is in the profitable range" as a cotton spray.

Technology Newsletter

(Continued)

National Bureau of Standards, in research performed for the Navy Bureau of Aeronautics, has come up with a two-layer, nickel-over-chromium plating that may make feasible turbine blades and other high-temperature aircraft components made of molybdenum. Although molybdenum has greater structural strength at high temperatures than steel, it hasn't been used in such high-temperature applications because of its susceptibility to oxidation. The new NSB coating is electrodeposited, prevents oxidation of molybdenum for over 1,000 hours at 980 C, and for over 300 hours at 1100 C. Besides being oxidation-resistant, the nickel-chromium coating is nonporous and ductile.

•

Esso is making good on its guarantee to supply ethylene to processors, following the disastrous Baton Rouge fire last month (*CW, Oct. 18, p. 23*). Interim ethylene plant operations, using idle compressors available at the refinery, began a week ago last Saturday—a week ahead of schedule—to take the drain off the underground storage supply at Sorrento, La. Meanwhile, General Electric has performed speedy repairs on the two 13,000-hp. gas turbines damaged in the fire. The first was returned to Esso only 37 days after the fire started; the second is being shipped this week.

•

How do zinc dialkyl dithiophosphate additives work in engine oil? Do they actually form the protective film attributed to them? Yes, says Chrysler Corp.'s Engineering Division (Detroit), as a result of a new technique they've developed. Using radioactive sulfur and phosphorus atoms, the oil additive receives the "tag" rather than the engine parts—the method previously used in engine-wear studies. The molecular film is only millionths of an inch thick, and "we . . . have learned some interesting things about its composition," says Sumner Twiss of Chrysler Research. The technique has been used on studies of hydraulic valve-lifter wear, looks promising for studies of lubricant-additive effects on other parts, such as hypoid gears.

•

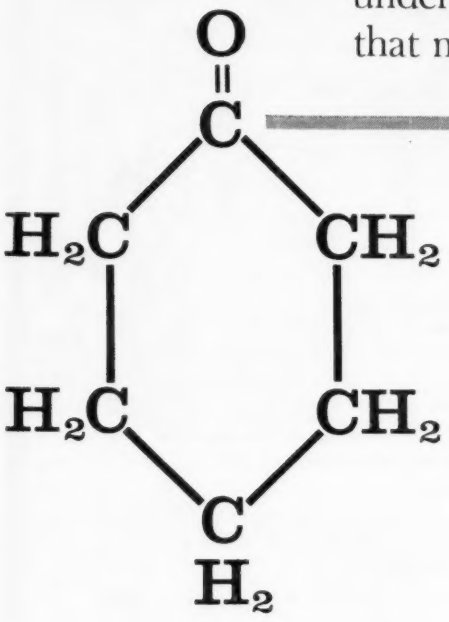
Shell Oil is out with a new grease claimed to be the first corrosion-resistant lubricant with an effective operating range from −100 F to 600 F. Named ETR grease H, it exceeds the proposed specification MIL-G-2501 3 C for both temperature range and hours of service. Potential uses: lubricating components of space vehicles, missiles, and supersonic aircraft.

•

Nuclear reactor fuel as a by-product of underground atomic explosions? John J. Grebe, Dow Chemical's director of nuclear research, told the Atomic Industrial Forum last week that H-bombs to be set off underground could be surrounded with a blanket of thorium which—as a result of the massive neutron bombardment of the explosion—could be used to enrich natural uranium reactor fuel elements.

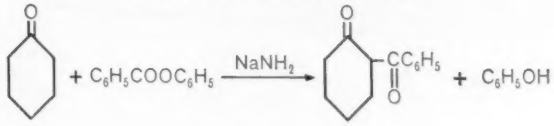
Du Pont "Hytrol" O Cyclohexanone

undergoes many interesting reactions that may suggest new applications for you

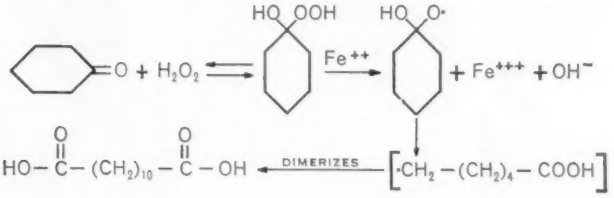


AMINATION

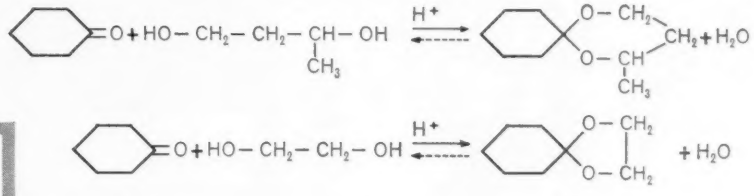
ESTER CONDENSATION



PRODUCING 5 - CARBOXYPENTYL RADICALS



REACTION WITH GLYCOLS



SPECIFICATIONS

Ketone Content	99.30% min.
Water	0.10% max.
Specific Gravity 25°/25°C.	0.9440-0.9460
Boiling Range at 760 mm. (ASTM D 1078-49T)	
1st Drop	153.5°C. min.
Dry Point	160.8°C. max.
Refractive Index, $n_D^{25°C.}$	1.4460-1.4500
Color, APHA	40 max.
Acid as Formic Acid	0.02% max.
Esters as Cyclohexyl Formate	0.70% max.

(All Percentages on Weight Basis)

Du Pont "Hytrol" O cyclohexanone, a reactive cyclic ketone, is a most convenient starting chemical for new intermediates or a useful reactant to modify existing products. Because "Hytrol" O is tautomeric it opens the way to a host of interesting derivatives. It's a powerful, medium-boiling solvent for rubbers, fats and oils . . . can be used in the manufacture of resins, printing inks and adhesives.

SEND FOR MORE INFORMATION TODAY. Just write address below on your company letterhead for a product sheet on this unusual chemical—its physical and chemical properties—its uses and possible applications.

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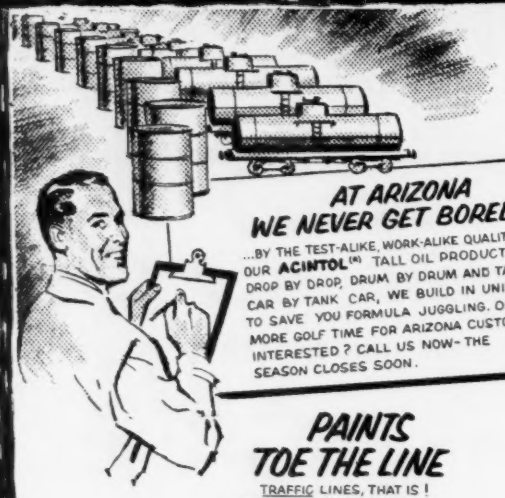
TALL OIL TALK FROM Arizona

CHEMICAL COMPANY
World's largest producer of products based on Tall Oil



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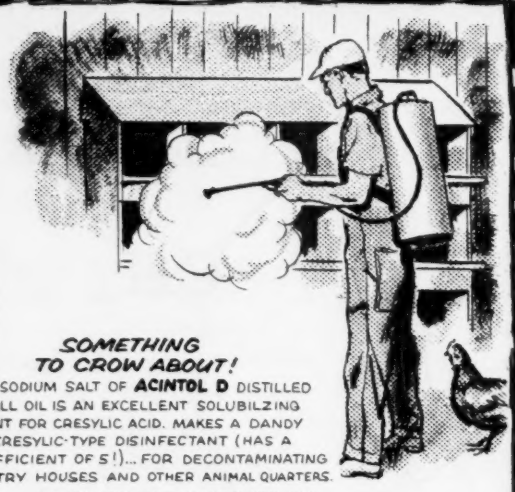

SOMETHING TO CROW ABOUT!

THE SODIUM SALT OF **ACINTOL D** DISTILLED TALL OIL IS AN EXCELLENT SOLUBILZING AGENT FOR CRESYLIC ACID. MAKES A DANDY CRESYLIC-TYPE DISINFECTANT (HAS A COEFFICIENT OF 5!)... FOR DECONTAMINATING POULTRY HOUSES AND OTHER ANIMAL QUARTERS.

A.S. DU BOIS, LONG ISLAND CITY, N.Y.

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TRAFFIC LINES, THAT IS! **ACINTOLS FA-1** AND **FA-2** TALL OIL FATTY ACIDS ARE PERFECT FOR USE IN AIR-DRYING WHITE AND YELLOW TRAFFIC PAINTS THAT DRY THROUGH FAST ALKYDS MADE WITH **ACINTOL** FATTY ACIDS RESULT IN THE TOUGH FILMS THAT GIVE THE EXTRA WEAR AND DURABILITY REQUIRED IN HIGHWAY SERVICE.

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ACINTOL FA-1 TALL OIL FATTY ACID IS EXCELLENT FOR THE SELECTIVE FLOTATION OF HIGH CALCITE MANGANESE ORES WHERE CALCITE IS TO BE REMOVED PRIOR TO "EMULSION" FLOTATION OF THE MANGANESE. **ACINTOL D** ACTS AS A COLLECTOR COATING OF MANGANESE OXIDES. ANOTHER EXAMPLE OF THE RANGE OF COLLECTOR PROPERTIES OF **ACINTOL** TALL OILS.

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DRUM UP AN IDEA — WIN A PRIZE!
Just send us your idea for a *new* use for Tall Oil Products. If it's first to arrive and we use it in an ad, you have your choice of a drum of ACINTOL or its equivalent in cash . . . NOT ONLY THAT! BUT . . . winner or not, we'll send you a prize just for entering. Send your Tall Oil Tale NOW to:

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Plywood Plans Change Adhesives Outlook

A major shakeup is taking shape in the market for plywood adhesives. That's how industry this week interprets Reichhold's plans for a new 30-million-lbs./year phenol plant at Tacoma, Wash. (CW, Nov. 8, p. 24). Reichhold boldly bets that the entire fir plywood industry will soon make a near-revolutionary mass move to the use of phenolic adhesives—and only phenolics.

This potential shift by plywood makers—biggest consumers (145 million lbs./year) of synthetic resin adhesives—could change the balance of the entire (natural and synthetic) adhesives market. The shift could add an estimated 10-12% to the synthetics market, now in the 440-million-lbs./year (100% solids) range. The increment would result from phenolic replacement of natural-protein glues now used by fir plywood makers.

And the shift may also cause rearrangement in the market for synthetic-resin plywood glues. Right now urea bonders (often upgraded with melamine resins) are used at a rate approaching 100 million lbs./year—more than twice the rate at which phenolics are consumed for plywood. Phenolics won't capture all this business, of course, since biggest share of urea-glue output is used in the big furniture-hardwood plywood industry. But a smaller fraction—used for "interior grade" fir plywoods—may be lost to phenolics.

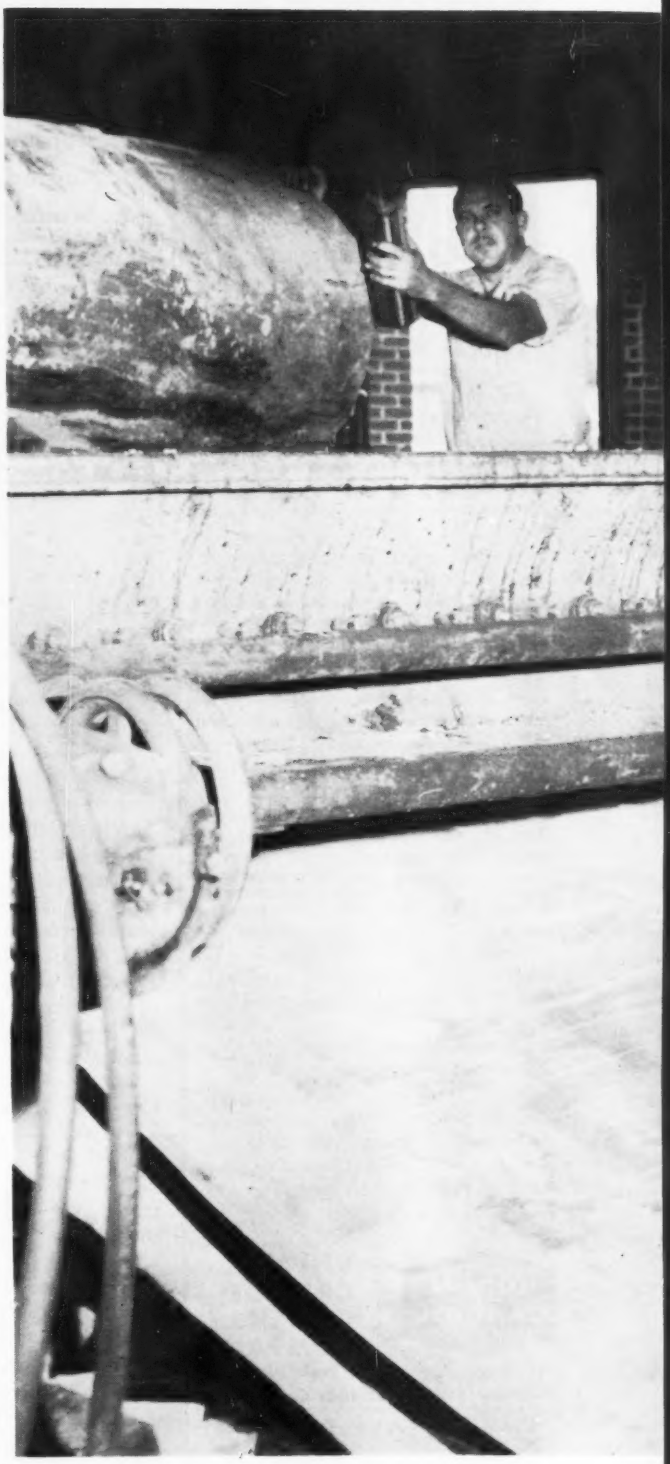
To a degree, Reichhold is gambling. The phenolics-only plan was broached publicly only last June (*CW, July 5, p. 60*), as a "proposal" by one official of the Douglas Fir Plywood Assn. The association says it's not actively pushing the shift; it's waiting for the idea to "sink in."

And while Reichhold and some other phenolics makers are promoting the campaign, some plywood makers are actively resisting it—it means use of a considerably more expensive glue, sometimes purchase of new equipment. And while phenolics would yield more durable products, there are plainly cases where this strength is not essential. Less costly laminates would be adequate—and more appealing—to plywood buyers.

In any case, the shift would occur gradually, with at least three years needed to make the full changeover. By that time, most synthetic-glue makers (who use many types of resin) will be set to accommodate the plywood manufacturers.

Part of the Story: Plywood-making now is the biggest consumer—almost one-third of total output—of synthetic glues.

According to a combination of government production figures and sales estimates, U. S. manufacturers in '57 turned out 433 million lbs. of resin for adhesives. About 252 million lbs. of this were phenolics; 139 million lbs., urea and melamine production. About 42 million lbs. of polyvinyls were sold (vs. production).



Plywood making takes big bite of glue output.

SOLVENT RECOVERY SAVES MONEY

SAVE 65% TO 80% ON PROCESS SOLVENT COSTS

Solvent recovery by the COLUMBIA Activated Carbon system is the efficient, economical way to recover solvents vaporized in manufacturing processes. Thus, it saves you money. Alcohols, esters, ethers, ketones, hydrocarbons, chlorinated compounds, and practically all mixtures of these solvents can be recovered and reused. And look at these facts . . . *efficiency—more than 99%: cost—1 to 2¢ per pound of recovered solvent.* Thus, you save 65% to 80% on your process solvent costs.

Here's how solvent recovery works. Vapor laden air is drawn from the evaporation process and passed through a bed of COLUMBIA activated carbon. The solvent vapor is adsorbed on the carbon and the denuded air is discharged into the atmosphere. When the carbon becomes saturated, the vapor laden air is switched to a second adsorber.

Then, low-pressure steam drives the solvent out of the carbon bed and the steam-solvent mixture is condensed. If the solvent is insoluble in water, an automatic decanter separates the mixture. If the solvent is water-soluble, distillation does the job.

CARBIDE can tell you how a solvent recovery plant can recover your process solvents. Write now for the booklet, "Solvent Recovery by the COLUMBIA Activated Carbon System." Address Department B, Union Carbide Olefins Company, 30 East 42nd Street, New York 17, New York.

UNION CARBIDE

UNION CARBIDE OLEFINS COMPANY

Division of Union Carbide Corporation
30 E. 42nd Street, New York 17, N. Y.

"Columbia" and "Union Carbide" are registered trade marks of Union Carbide Corporation.

SIX OUTLETS FOR SYNTHETIC RESIN ADHESIVES

How much they will consume in 1958. Figures are estimates.

1. Plywood	**145-150 million lbs.**
2. Furniture, cabinets	**20 million lbs.**
3. Particle board	**75 million lbs.**
4. Automobiles	**25-30 million lbs.**
5. Coated, bonded abrasives	**17 million lbs.**
6. Brake linings, clutch facings, etc	**14 million lbs.**

The largest share (27.5%) of the phenolics goes for laminating applications (other than plywood); this amounts to 69 million lbs. About 53 million lbs. (21%) are used for thermal insulation (bonding rock wool, glass fiber); 46.5 million lbs. (18.5%) for plywood; 16.6 million lbs. (6.6%) for coated abrasives; 15.2 million lbs. (6%) for brake lining and clutch facings; the rest (20.4%) for miscellaneous adhesive uses. Plywood demand for phenolics dropped in '57, reflecting a reduction in housing construction. But the plywood industry has been taking steadily increasing amounts—'53 requirements were 36 million lbs.

Melamine* and urea glue resins, as a group, now take second place (139 million lbs. produced in '57) in the over-all synthetic adhesives picture. This currently is the most used type for plywood (98.1 million lbs. or 71% of the total). The quantity of melamine and urea resin slated for plywood also fell in '57; in '56, the figure was 107.6 million lbs. Laminating applications took about 31 million lbs. of melamines and ureas in '57, and the remainder went into a variety of other glue uses.

For the most part, this phenolic glue has gone for fir plywood, not hardwood ply.

Vinyl resin sales have remained at the 42-million-lbs./year level for two years; they have gained considerably since '53, when sales were 24.2 million lbs. Vinyls, which are comparatively high-cost resins, are used mainly for paper bonding materials.

Promise in Packages: Synthetics have boomed in the past five years. But they still have a long way to go in the total (synthetic and natural) adhesive market.

*Often combined in statistics, because much of the relatively expensive melamine is used (in small proportions) to modify the urea adhesives.

The single largest consumer of glues is the packaging industry, which —as Richard Smith (H. B. Fuller Co.) last week told members of the Chemical Market Researchers Assn. at Minneapolis—used 1 billion lbs. of adhesives, worth $115 million, last year. And this market, so far, is largely held by natural glues of one sort or another, although vinyls play an important role. Any gain by synthetic resin adhesives won't come easily; in the corrugated boxboard field, for example, improvements in starch glues have enabled those materials to take substantially more than half the market that was once primarily sodium silicate's.

Looking for Markets: The determination of natural-glue makers to hold the packaging market raises speculation that new products and new applications represent synthetic adhesives' best growth opportunity.

This could possibly be in home construction work, or in automotive, aircraft, marine, or appliance manufacture. In some of these cases, markets won't develop unless suitable, specific adhesives are available.

Some 4-10 lbs. of adhesives currently go into every automobile made. Total adhesive consumption by the auto industry depends heavily on car production. If, as predicted, 6-7 million cars are turned out in '59, a 35-40 million lb. adhesive market will result. But this will be a drop in the bucket, compared with possible future demand if—for example—plastic auto bodies gain wide acceptance.

Already, a host of new bonding agents are in the research laboratories. But the old problems of reducing costs, simplifying application, improving heat stability, shortening setting times, etc., still draw plenty of attention from researchers.

BRIEFS

on a surge of new interest in two phosphorus chlorides... how to save some money when you use sulfides... how you can see the purity of carbonate of potash... some data on oxalic acid

Phosphorus chlorides ... growing, growing

You will be hearing more about the Hooker phosphorus chlorides described below. Current trends in organic synthesis are creating a growing need for the properties they put at your command.

Phosphorus oxychloride, $POCl_3$, is something you'll want to investigate if you're developing organic phosphates or plasticizers, gasoline additives, fire-resistant hydraulic fluids, or chlorinated products.

As a chlorinating agent, it neatly supplements and broadens your already wide choice of Hooker chlorine compounds. It's used also as a catalyst for intermediates and dyestuffs, and in preparation of medicinals such as sulfa drugs.

A clear water-white liquid, it assays 99.5% min. $POCl_3$; contains no free chlorine or phosphorus pentachloride.

Phosphorus trichloride, PCl_3, is fast winning repute as a convenient entry to many types of organic synthesis. You can use it as a chlorinating agent in manufacture of organic acid chlorides; as a condensing agent in preparation of organic aldehydes; in making phosphite and phosphonate esters; and as a catalyst in certain chlorination reactions. It's a clear water-white liquid of 99.5% minimum purity.

If you're already buying either of these versatile products in quantity, or plan to do so soon, be sure your supplier has what it takes to get the material to you promptly. Both these chemicals require special handling; volume deliveries are usually made in lead-lined, insulated tank cars.

When you purchase from Hooker, you *can* be sure, because you have at your disposal the largest fleet in the country of these special cars.

For contract information, write us. For technical data sheets, just check the coupon.

Sulfide economics

A different molecule might save you money. If you're buying sodium sulfide as a source of combined sulfur, here's a way to get the sulfur for about 5 cents a pound less.

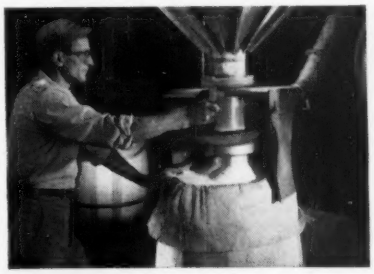
Just switch to Hooker *sodium sulfhydrate*.

In 100 lbs. of sodium sulfide, you get about 24.6 lbs. of combined sulfur. The same weight of sodium sulfhydrate gives you about 40 lbs. of sulfur—about 62.6% more.

At prevailing prices, the sulfur in sodium sulfide costs you about $.244 a pound. In sodium sulfhydrate, it's only about $.181 a pound.

Your actual saving is larger than the difference—because sodium sulfhydrate contains less water of crystallization, so freight cost is lower.

If this approach to lower-cost sulfidity looks like a good one for you, why not explore it with your Hooker salesman? He'll gladly help you review the facts with your specific needs in mind.



K_2CO_3: so pure you can see through it

Chances are good that some of this free-flowing white material occupies a prominent place in your living room.

One of many interesting uses of NIALK® carbonate of potash is in making clear glass. Your 21-inch TV picture tube contains about five and a half pounds of carbonate. It also goes into glass you read through, fluorescent lights you read by, glass you drink from, glass *objets d'art* you look at in museums.

Carbonate of potash has many other uses, but the important point about *this* use is that the carbonate must be of high purity. Ours is.

One essential step that helps preserve this purity is the packaging operation you see here. Carbonate of potash in solid form is highly hygroscopic, so we protect it with a moisure-resistant lining in every barrel, fiber drum, or bag of it we send you. If you use large amounts, we ship it to you in specially designed 50-ton dry-chemical hopper cars.

You can get NIALK K_2CO_3 as a liquid at 47-52% strength, though most users prefer to save freight by having it shipped in one of these four solid forms:

1. *Hydrate, regular,* 83.5-84%. This dust-free form is made from liquid K_2CO_3 which we evaporate to crystallize the solid sesquihydrate.

2. *Calcined, regular,* 99+%. The hydrate form is calcined to take water content down to less than 1%. It's granular, dust-free.

3. *Calcined powder,* 99+%. If your process won't accommodate the granular form, you can have this powdered form in your choice of three particle sizes.

4. *Powder,* 91-94%.

High purity . . . dust-free granular forms . . . wide choice of containers . . . moisture-resistant packaging for dry forms—these are some of the reasons why industry buys more NIALK carbonate of potash than any other brand.

May we show you how these advantages can help *your* process move more smoothly?

Data on oxalic acid

To keep your technical file up to date, send for our newest publication on OLDBURY® oxalic acid: Data Sheet No. 789.

It lists specifications, typical physical properties, packing data, uses, and handling precautions. For a copy, check the coupon.

For more information on chemicals mentioned on this page, check here:

- ☐ Phosphorus Oxychloride
- ☐ Phosphorus Trichloride
- ☐ Phosphorus Pentachloride
- ☐ Sodium Sulfhydrate
- ☐ Sodium Sulfide
- ☐ Carbonate of Potash
- ☐ Oxalic Acid
- ☐ New list of products—Bulletin 100-B

Clip and mail to us with your name, title, company address. (*When requesting samples, please use business letterhead.*)

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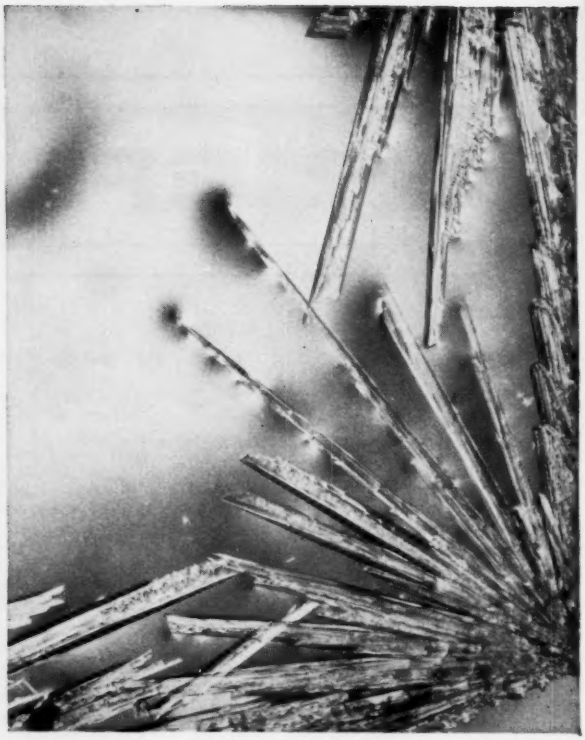
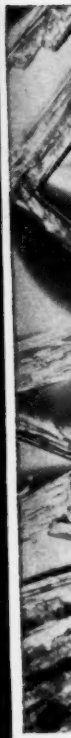
Sales Offices: Chicago Detroit Los Angeles New York Niagara Falls Philadelphia Tacoma Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B.C.

HOOKER CHEMICALS PLASTICS

1 Photomicrographs show the formation of crystalline phthalic anhydride from the liquid state—key to Barrett purity measurements. First crystals appear as liquid is cooled to freezing point.



2 Crystals grow rapidly from "root" of first formation. Temperature variations are carefully plotted during this phase change to determine freezing point of sample.



3 C s —per

A New Standard of Purity f

RESEARCH *has established the purity of commercial Allied Chemical Phthalic Anhydride at 99.7 mole per cent. This high assured purity and Allied Chemical's definitive method of measuring it, open a new age of confidence for every PA user.*

Forget everything you've heard before about phthalic purity. For Allied Chemical has set a new standard of purity for phthalic anhydride, a standard which carries tremendous significance for every phthalic user.

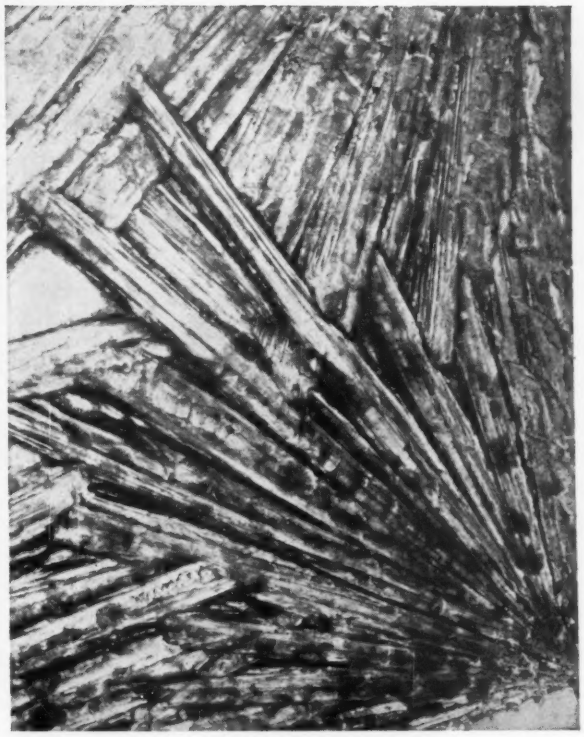
The Allied Chemical laboratories have created this standard using a technique of physical chemistry described in the picture sequence above. It is a highly accurate, definitive method for measuring phthalic purity. And it has been used to establish the purity of Allied Chemical Phthalic Anhydride (commercial specifications) at 99.7 mole per cent.

This is an impressive degree of assured purity when you compare it with phthalic purity measured by titration. Acid impurities are included in purity determinations made by titration, giving you no firm limit on total impurities. On the other hand, the purity measurement of Allied Chemical Phthalic Anhydride leaves no room for doubt.

Now you have greater assurance than ever that our Phthalic Anhydride will react smoothly and contribute its full share to the uniformity of end products—be they alkyd resins, polyesters, plasticizers or chemical intermediates. For Allied Chemical PA must now measure up to an uncompromising standard of purity—a standard that phthalic users have long needed.

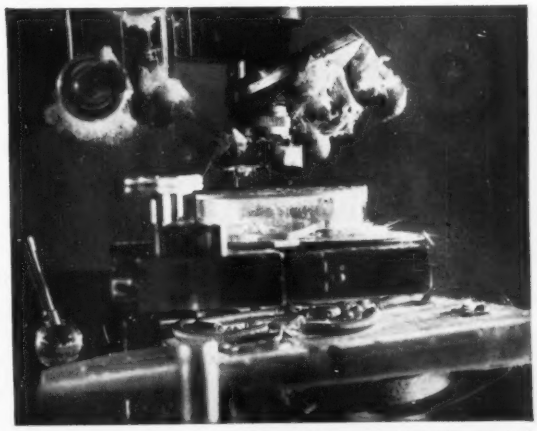
Enter a new age of confidence in your purchasing of phthalic anhydride with Allied Chemical PA, molten or solid—99.7 mole per cent pure! Call your representative or write direct for complete details of our service and quality.

3 Crystals have now engulfed 75% of area. Freezing point of sample is compared with that of 100 mole % phthalic anhydride —permitting accurate calculation of over-all purity.



4 Completely crystallized phthalic anhydride is shown, magnified 25 times. By the method of calorimetric freezing point determination, Barrett commercial phthalic measures 99.7 mole % pure.

for Phthalic Anhydride



This microscope assembly was specially designed to take photomicrographs of crystal growth in progress (see sequence above). Just below the lens of the microscope, optical glass covers the microslide, protecting lens from heat of molten sample. Below the slide is heating element used to control rate of crystal formation, which takes place at 132° C. Frost-like deposits are sublimed crystals of phthalic anhydride formed gradually during long hours of delicate photography.

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Ammonium Fluoborate
Antimony Trifluoride Sublimed
Barium Fluoride
Bismuth Fluoride
Boron Trifluoride
Boron Trifluoride Complexes
Chromium Fluoride
Copper Fluoborate
Fluoboric Acid
Fluorine Cells
Fluorinating Agents
Frosting Mixtures
Hydrofluoric Acid Anhydrous
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Lead Fluoborate
Metallic Fluoborates
Potassium Bifluoride
Potassium Chromium Fluoride
Potassium Fluoborate
Potassium Fluoride
Potassium Titanium Fluoride
Silico Fluorides
Sodium Fluoborate
Tin Fluoborate
Zinc Fluoborate
Zinc Fluoride

Market Newsletter

CHEMICAL WEEK
November 22, 1958

Expansion is the keynote of American Cyanamid's flakeboard operations. Production at its new 40-million-sq. ft/year plant is now under way following formal opening last week. The board is produced from green flaked wood, bonded with waxes, synthetic resins and other materials under heat, pressure. Cyanamid sees major markets shaping up in decorative wallboard, furniture cores, sandwich panels. And in the future, the firm hints, it may be able to chemically treat the board to render it termite- fungus- or fireproof.

•

Good news for consumers of neomycin sulfate U.S.P. A whopping, $100/kg. price cut (bringing it down to $250/kg.), initiated earlier last week by American Cyanamid, is being met by major producers.

•

Union Carbide is putting finishing touches on its fluorocarbon facilities this week. Commercial production in its 50-million-lb./year plant is slated to begin next week at Institute, W. Va.

Elsewhere in the field, Du Pont is probing a new outlet for Freon 13 (monochlorotrifluoromethane): auto shock absorbers. They are bowing in on '59 Cadillacs, may appear on other high-priced GM lines in '60. But the total market is limited. Du Pont estimates that 1 lb. will do for about 400 cars.

•

Ferment in the highly competitive fumaric acid market continues unabated (*CW, Nov. 15, p. 97*). This week, Monsanto Chemical disclosed plans to "double previous capacity" at its St. Louis facilities. Completion is scheduled for spring, '59. Capacity figures haven't been disclosed but seasoned trade observers speculate they will be modest—perhaps no more than 2-3 million lbs. Monsanto's disclosure catches many by surprise; until now, the company had not admitted to a manufacturing position in fumaric. Its output is destined for both captive and open market outlets.

•

There's now a 50% overcapacity of fluorinated hydrocarbons in the U.S. and supply will remain substantially greater than demand for several years according to Du Pont's J. C. Hoopes, who last week spoke at the Chemical Market Research Association's Market Shop at St. Paul, Minn.

Total design capacity of four producers (Du Pont, Allied, Pennsalt, Union Carbide), he said, is about 410 million lbs./year; but the industry can operate at 20% overcapacity, hence actual total capacity is more than 490 million lbs./year. Current demand for fluorinated hydrocarbons in refrigerant and other uses totals approximately 280 million lbs.—about half current capacity.

Although Hoopes didn't say so, it's likely that urethane foaming uses (*CW Market Newsletter, Nov. 15*) will help considerably to cut down current overcapacity. Most industry spokesmen, however, aren't going out of their way to publicize the new use, are loath to predict the size of future foaming markets.

•

Epoxy resin markets have failed to match earlier expectations and there's little hope that a big surge of demand is forthcoming in the foreseeable future. Relatively high price of epoxy materials is the main reason for less-than-hoped-for growth of the industry, according to Shell Chemical's A. Jonnard, who also held forth at the CMRA market shop.

Epoxy resin consumption, Jonnard noted, climbed rapidly from 3 million lbs. in '51 to 20 million in '55; but the growth rate then slowed considerably—demand reached 28 million lbs. in '57, should tally 30 million in '58.

Jonnard admits these figures are lower than those reported by the U.S. Tariff Commission, says captive consumption is probably less than 10% of the total—hence the big gap between production and sales of epoxy resins results from increased inventories. Clue to bigger epoxy markets, said Jonnard, lies in education of potential buyers to idea that relatively high priced epoxies—compared with competing materials—are worth the money, by virtue of superior properties; but, admittedly, it's an uphill climb to get this idea across to resin buyers.

•

An "Inorganic paper"—a brand new product developed by Minnesota Mining and Manufacturing Co. — was a teaser exhibit shown to CMRA attendees who toured the firm's huge Minneapolis central research laboratory last week. Potential uses include fireproof document paper, insulation materials; these products can be turned out on regular paper-making machines, will be priced low enough to compete with orthodox materials in these uses.

Visitors' burning curiosity about composition of the "inorganic" paper wasn't satisfied by 3M spokesmen. But there's a good chance that the secret will be out within a month, by which time 3M expects to make samples available to potential users.

SELECTED PRICE CHANGES—WEEK ENDING NOVEMBER 7, 1958

	Change	New Price
UP		
Copra, Pac. ports, cif, ton	$20.00	$245.00
Tung oil, dms., c.l., N. Y.	0.0025	0.2275
DOWN		
Chrome orange, C.P., bbls., dlvd. E. of Rockies	$0.0350	$0.3150
Chrome yellow, C.P., bbls., dlvd. E. of Rockies	0.0350	0.3150
Mercury metal, 76 lbs./flask, net flask	1.00	229.00
Neomycin sulfate, fib. dms., 1 kilo basis activity, gram	0.10	0.25
Platinum metal, wks., oz.	1.00	53.00

All prices per pound unless quantity stated.

interested in U.F. resins?

Allied U.F. CONCENTRATE—85 gives you 5 economies

This is how Allied's "U.F. Concentrate—85" saves money five ways over urea and formaldehyde compounded separately:

1

2

3

4

5

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because there's less water to evaporate. "U.F. Concentrate—85" gives you 60% formaldehyde, 25% urea, only 15% water.

LESS KETTLE CAPACITY, LESS STEAM REQUIRED

With a higher concentration of active ingredients, you can use a smaller kettle—or produce bigger batches with existing equipment.

NO HEATED STORAGE

You don't need it—even though "U.F. Concentrate—85" gives you the highest concentration of formaldehyde commercially available.

LESS STORAGE CAPACITY

for a given amount of active materials. Water content of "U.F. Concentrate—85" is a minimal 15%.

LESS MATERIALS HANDLING

because formaldehyde is of high concentration with urea in liquid form.

Allied Chemical

You'll find more details in Allied's 36-page brochure "U. F. Concentrate—85." Write for it.

Ethanolamines • Ethylene Oxide • Ethylene Glycols • Urea • Formaldehyde • U. F. Concentrate—85 • Anhydrous Ammonia • Ammonia Liquor • Ammonium Sulfate • Ammonium Nitrate • Sodium Nitrate • Methanol • Nitrogen Solutions • Nitrogen Tetroxide • Fertilizers & Feed Supplements

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and Mastics

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Detergent Additives
Spray-dried Chemicals
Organic Chemicals

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Emulsifiers and
Surface Active Agents for
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and other industries

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14 Manufacturing Plants • 7 Research and Technical Service Laboratories
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chemicals at work

In a multitude of applications throughout industry, Witco stearates are at work modifying oil viscosity, improving solids suspension, stabilizing resin compositions, imparting water repellency, providing internal lubrication, increasing skin adhesion of cosmetic powders, and generally helping manufacturers develop better products at lower cost.

Stearates are big business, yet they form only one product line of one Witco division. Witco manufactures a wide range of other industrial chemicals in bulk quantities. Emulsifiers, detergents, asphaltic compounds, carbon blacks... whatever the product, the name *Witco* guarantees its high quality.

When you buy Witco, you also buy unsurpassed service. For example, up-to-date technical laboratories are on call at all times to help customers with processing or raw materials problems... on your behalf, these laboratories will determine the best *Witco* product for your purpose, or if necessary, develop an entirely new one to meet your requirements.

At some point in your products or processes, Witco chemicals can be of benefit to you. Write today for details.

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Witco Zinc Stearate is an outstanding mold lubrication agent for plastics. Incorporated in molding compounds or dusted on mold surfaces, it reduces ejection pressures to a minimum, thus eliminating breakage or disintegration of the finished product.

Increasing mechanization makes big demands on lubricant manufacturers. By making full use of Witco's Lithium Stearates, greasemakers are able to upgrade their products, cut processing time and eliminate much of the control testing which would otherwise be necessary.

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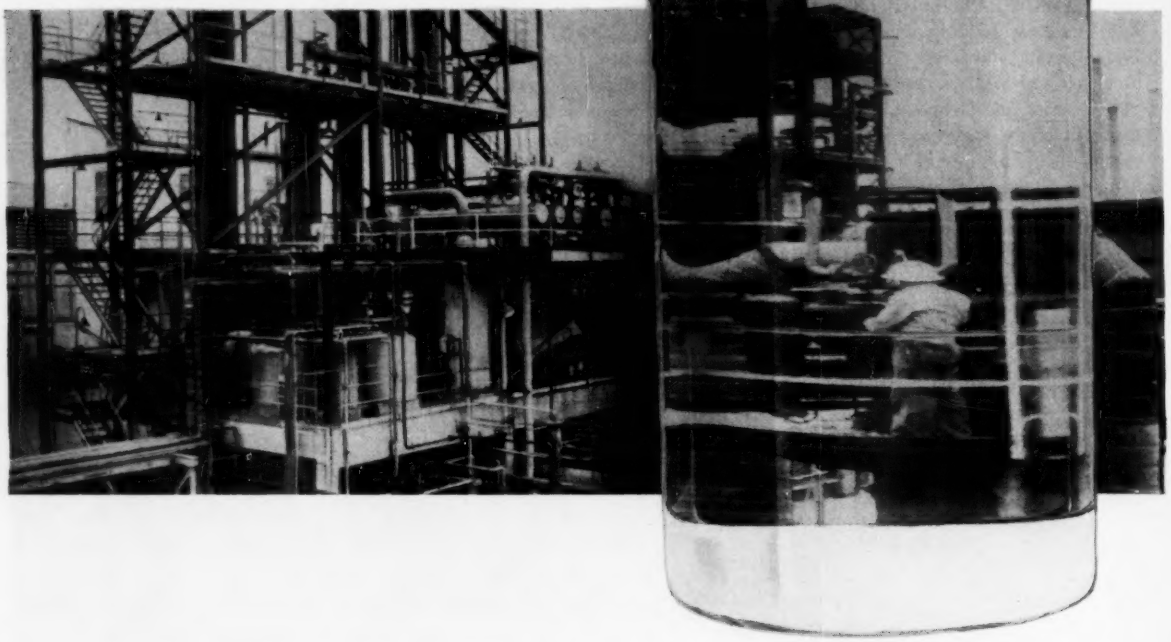
WESTVACO'S CARBON BISULFIDE PLANT

still sets the industry quality standard!



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Made by the newest continuous process... automatically controlled . . . Westvaco® Carbon Bisulfide is crystal clear and colorless. Its unusual purity is safe-guarded by shipment in our fleet of "deluxe" tank cars, specially lined to prevent the slightest contamination. Service is always fast and dependable.

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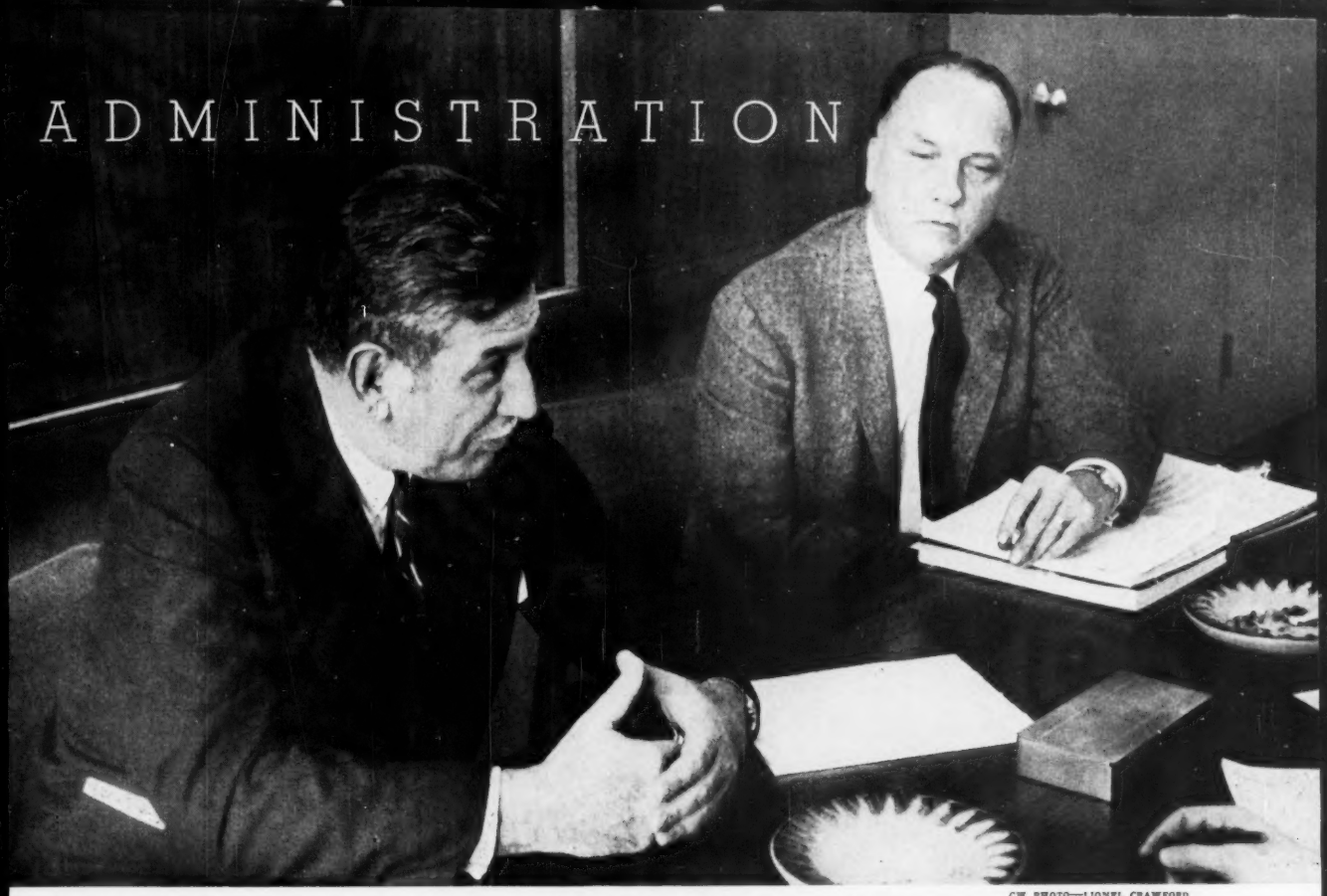

CW PHOTO—LIONEL CRAWFORD

Electromet's Intemann (left) and Douglas explain their decision to push the company into new fields.

Electromet Side-Steps Into Chemicals

"If you want to broaden your horizons in the metals and alloys business, you've got to diversify, get into new fields." That's the philosophy expressed last week by Electro Metallurgical Co.'s President H. K. Intemann, and it's the keystone of the company's recent and somewhat unexpected move into the development and production of metal chemicals.

The move is calculated to broaden Electromet's base of operations, develop another outlet for the metals in which it already has a strong ore position. In sales and profits, the new business—already approaching six figures annually in closely controlled sales, and growing rapidly—might possibly become Electromet's leading breadwinner.

Business Side Step: Electromet's move into the production of chemical derivatives of metals is actually a side step for the Union Carbide division. The company has considerable chemical experience, outgrowth of its extensive use of chemical treatment in the production of its metals. (Up to 75% of some EM metallurgical processes are chemical.)

Because of its accumulated skills in metal chemistry and its possession of chemical equipment, EM was the logical division within the Carbide complex to carry out the corporation's decision to produce metal chemicals, Intemann said.

Theory on Production: EM's chemical business is still in the budding stage. Currently, research and development and limited production are being carried out by the newly formed Technology Division at the company's Niagara Falls, N.Y., plant. But, Intemann told *CW*, EM has its production theory outlined and ready to go as the demand for its chemical products grows.

The three-phase theory goes something like this:

In the first phase, EM researches and develops new metal chemicals, either in response to known customer needs or with the hope that a demand can be created.

When a particular chemical is ready for significant but limited production, the second phase is entered and production of the chemical is transferred to an existing plant location, where the metal from which the chemical is derived is being produced. For example, the production of titanium chemical derivatives would be transferred to EM's titanium plant.

The final phase begins when the demand for the chemical exceeds the capacity of existing facilities. At this point, EM management must decide where to construct additional production capacity. "In all cases," Intemann said, "the governing rule will be to place additional capacity as close to the customer as possible. In some instances, that could mean actually moving production of the raw material, including the metal producing facility itself."

According to Intemann, of the 128 chemicals EM is now developing, 100 are in phase one, 10-12 are in phase two, and the rest are somewhere in between.

Sales Force Develops: "We're not

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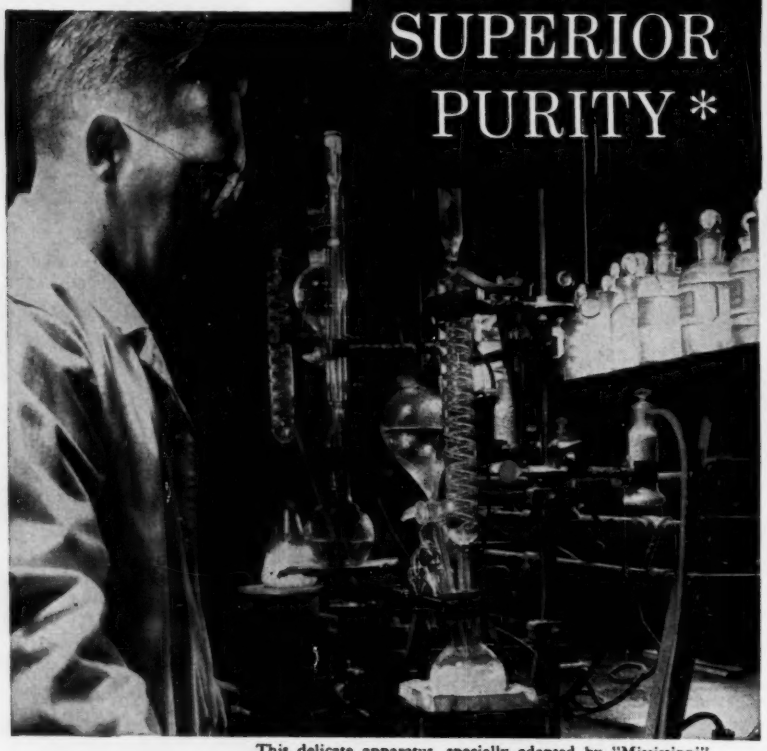

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'We were a natural for the job.'

going around putting up new plants in corn fields and hiring people for the new operation," Intemann said. "In fact," he added, "we plan to have our sales force grow with the chemicals. We hope to turn some of our technical people into salesmen."

A technician who helped develop a chemical would become its salesman when that chemical was promoted to production status. That, briefly, is EM's plan.

In some instances, the company's chief points out, a new metal chemical might be turned over to another Carbide division for marketing, as has been the case with other Carbide products in the past.

"In every instance," Intemann says, "prime consideration will be given to the division with the best sales and distribution setup for the chemical under consideration." Foreign market development and sales, he adds, will be handled by Union Carbide International, the corporation's export arm.

Most of the new chemicals EM produces will be in the $2-10/lb. range. Both Intemann and EM's J. C. Douglas, vice-president—technology, agree that it's difficult to predict the sales potential of the company's new business. Production of some chemicals, such as titanium trichloride, metal carbonyls and subchlorides of vanadium, they said, might quickly jump 300-400%. Output of others might increase 10-15% over present production over a long period.

The company also is working in the high-energy and nuclear fields, but prefers to work for prime contractors

rather than under direct contract with the government.

Time Is Ripe: Considering that EM has had its metal chemicals know-how and equipment for a number of years, the question naturally arises, "Why has the company waited until now to make its move?"

Intemann answers, in part, this way: "Until three years ago, research and development were concentrated on ferroalloys. Now, with many of those metals doing well and with no shortage anticipated, men and equipment can be spared for work in the chemical area." In addition, he said, the development of nuclear and high-energy fuels has focused attention on the fine potential of the metal chemicals business.

No Particular Problems: Exhibiting a great deal of faith in their new business, Intemann and Douglas told *CW* they expect no over-all technological or marketing problems. "The problem of finding the best process is always a difficult one," Intemann said.

"You seldom get the right one first," Douglas added. "Often the process is changed completely before it's found acceptable."

Commenting on the new opportunities in EM's metal chemicals business, Intemann also summed up the executive thinking that stands behind the decision to diversify. Said Intemann, "Now we're more flexible. Our equipment is like an Erector set in that it can be used in a variety of ways. And, if one chemical we're working on collapses, there'll be others to work with."

'We look for the right process.'

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LEGAL

Chlorine Leak Suits: Allied Chemical Corp. and International Paper Co. have been named defendants in 43 suits asking a total of $2 million. The suits were filed in New York state supreme court by 43 upstate residents.

The actions were brought as the result of injuries allegedly sustained due to leakage in several pipes leading from an Allied tank car containing liquid chlorine to International's plant at Corinth, N.Y. (not far from Albany). The suits charge that escaping chloride vaporized on leaving the pipes and spread over nearby workmen. Workmen employed by the paper company, several subcontracting firms and the Hartwell Co., general contractors for a new building at the Corinth plant, were hospitalized after the incident—which, according to the charges, occurred last Feb. 2.

Supreme Court Justice Andrew M. Ryan has ordered that the suits be consolidated into a single trial to take place in Saratoga County. No date has been set. The trial will determine only the question of liability, if any. If liability is charged against either or both of the firms, subsequent proceedings will determine the amount to be awarded each claimant.

•

Index Chemical Cleared: Index Chemical Co. has been cleared of charges that it polluted Green's Bayou in Texas. The company had been charged by the U.S. attorney general's office (Houston) with allowing carbon bisulfide to enter navigable waters.

U.S. District Judge Joe Ingraham, hearing the case without a jury, said that he had reasonable doubt that the carbon bisulfide presented as evidence by the government came from the Index plant.

LABOR

Arbitration Conference: Industrial executives, labor union officials and arbitrators from several Midwestern states this week participated in Illinois Institute of Technology's Arbitration Workshop.

Workshop sessions, each with its panel of union and management representatives, dealt with a raft of problems: seniority arbitration in a recession; labor arbitration systems and procedures; case preparation and

presentation; how to lose an arbitration case; arbitration of technical cases; scope of the arbitrator's authority; arbitration of discipline and discharge cases. In addition, members of the audience presented arbitration problems for suggested solutions.

Among the industrial participants was Union Carbide's J.E. Shipp, assistant head of the industrial relations department, who served on the panel for seniority arbitration. William Lee, president of the Chicago Federation of Labor, spoke on present and future industrial relations in the Midwest.

Nearly 300 attended the two-day conference, sponsored by American Arbitration Assn., National Academy of Arbitration and Illinois Tech's Business and Economics Dept.

•

Rubber Contract: Production at New York Rubber Corp.'s Beacon, N.Y., plant was back in full swing this week, after a 15-week strike. Company and union officials have agreed on a new one-year contract.

The agreement comes less than a week after the company put the closed plant up for sale and declared its intention to move the operation elsewhere.

New York Rubber President Herschel G. Harris described the new contract as one that promotes flexibility and efficiency. He says the company will continue its efforts to establish additional manufacturing facilities at another location.

KEY CHANGES

Thomas L. Daniels to board chairman, **John H. Daniels** to president and chief executive officer, **Richard G. Brierley** to executive vice-president, Archer-Daniels-Midland (Minneapolis, Minn.).

Robert O. Weiss to president, **Frank C. Johnson** to vice-president in charge of sales, Metalsalts Corp. (Hawthorne, N.J.).

John B. Clopton to vice-president and director of sales, **Albert E. New** to vice-president and director of production, **W. Mayo Smith** to vice-president and director of research, Escambia Chemical Corp. (New York).

Leo I. Dana to vice-president — technology, **David Swan** to vice-president — research, Linde Co., division of Union Carbide Corp.

C. R. Bergherm to executive vice-president, Engelhard Industries.

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(4-Methyl-6-Tertiary-Butyl Phenol)
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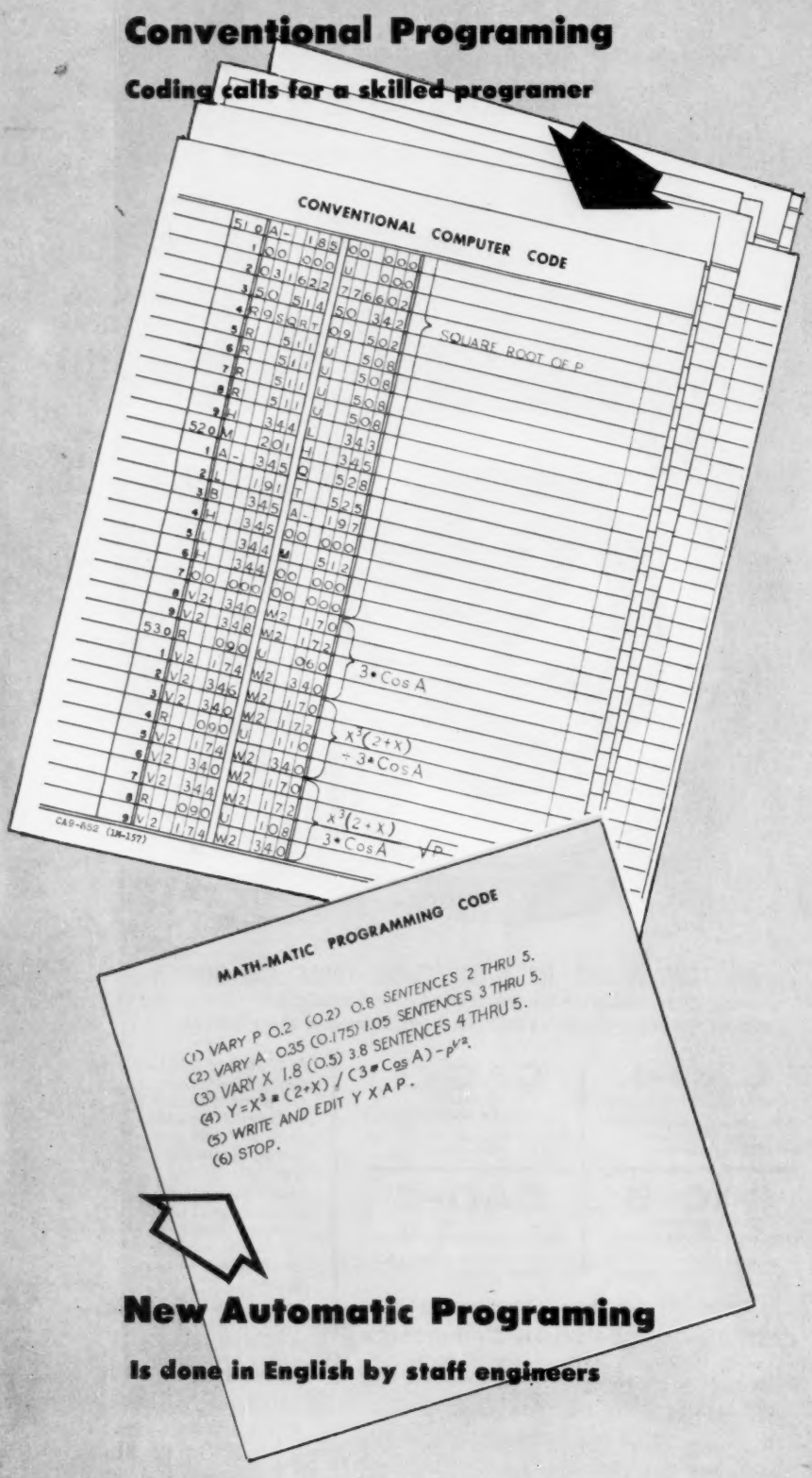

Conventional Programing
Coding calls for a skilled programer
CONVENTIONAL COMPUTER CODE
SQUARE ROOT OF P
MATH-MATIC PROGRAMMING CODE
(1) VARY P 0.2 (0.2) 0.8 SENTENCES 2 THRU 5.
(2) VARY A 0.35 (0.175) 1.05 SENTENCES 3 THRU 5.
(3) VARY X 1.8 (0.5) 3.8 SENTENCES 4 THRU 5.
(4) Y=X³ * (2+X) / (3 * Cos A) - P^1/2.
(5) WRITE AND EDIT Y X A P.
(6) STOP.
New Automatic Programing
Is done in English by staff engineers

Computers Now Read Plain English

Remington Rand Univac this week is preparing to supply all of its computer users with a new system of automatic programing—Univac Math-Matic—that simplifies the job of coding engineering problems for computer calculation. The technique bypasses the time-consuming job of translating a problem into hundreds of standard code instructions. The time of both computer and engineer is saved.

Math-Matic is the fourth in a series of compiling systems developed by Remington Rand, is the first to break the language barrier between man and machine for commercial users.

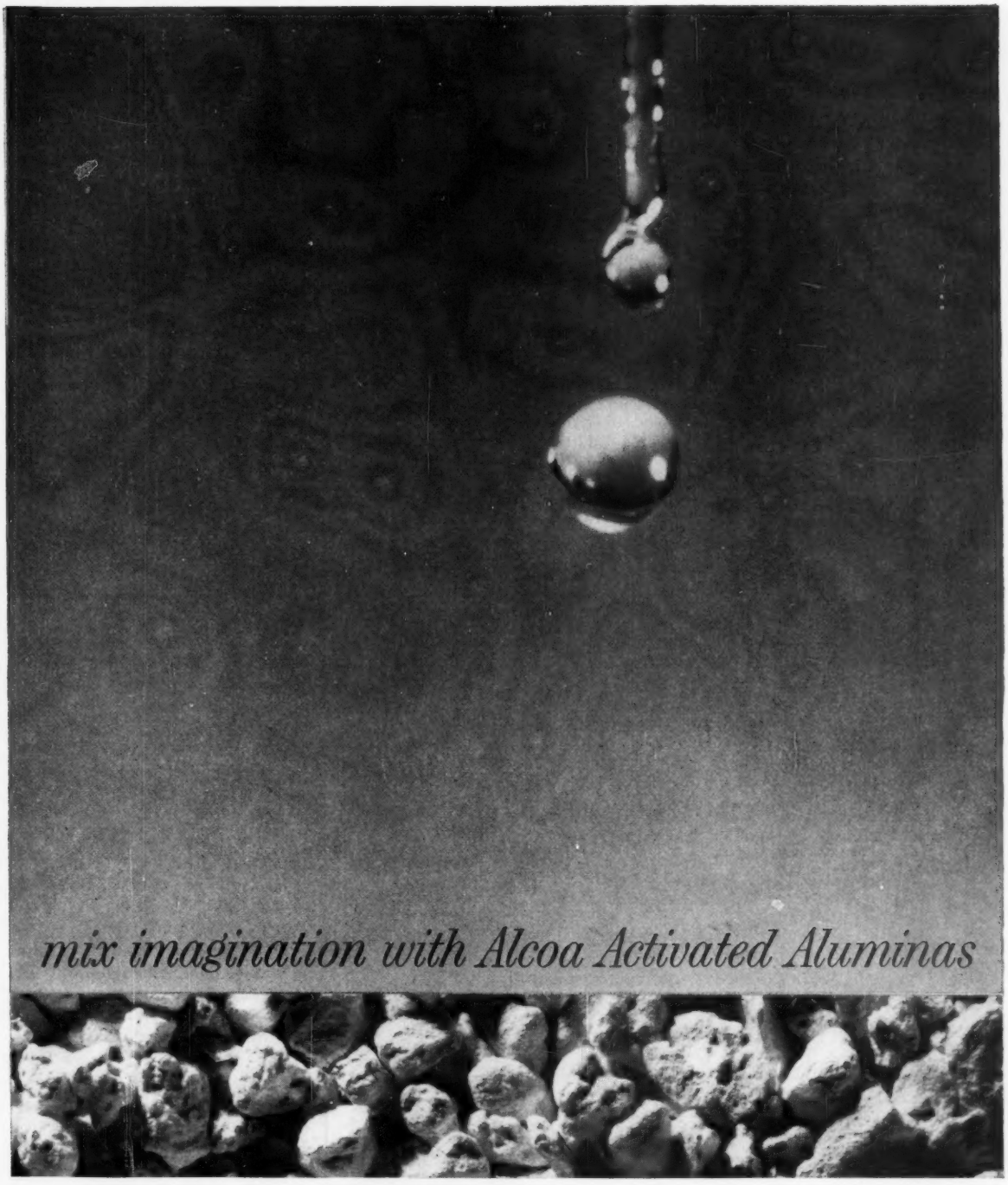
Now, programing instructions may be written in ordinary language, instead of standard computer code. Key: a new compiling technique that utilizes the computer's prodigious speed and memory. All that's needed is a special library tape on which are stored all of the sub-routines required for conventional mathematical calculations.

By following the simple instructions written in Math-Matic pseudo code, the compiler analyzes the operations required for each step of the calculation, selects appropriate sub-routines from the library tape and writes its own final program in standard code. The compiler is also equipped with a built-in "generating glossary" that fabricates coding as needed for sub-routines not stored on the library tapes.

In addition to supplying the library tape, Remington Rand provides computer users with coding manuals and gives their engineers a short instruction course.

Program Shortcut: Conventional coding of engineering problems generally requires at least a two-man team: an engineer, to define the problem in mathematical terms; a programer, to translate the problem into coded instructions.

With this system, complex problems often require several days, or even weeks, for programing and "de-bugging" (correction of coding errors).



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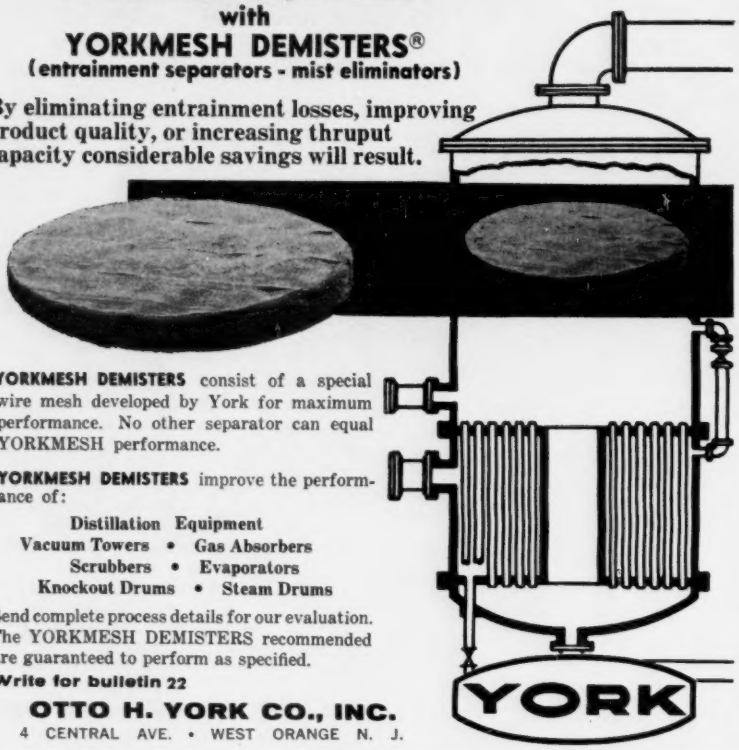

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With Math-Matic, on the other hand, an engineer can usually put a problem into pseudo code in minutes, using only English instructions and conventional mathematical notations. And since the sub-routines stored on the library tape are free of coding errors, de-bugging is now virtually eliminated.

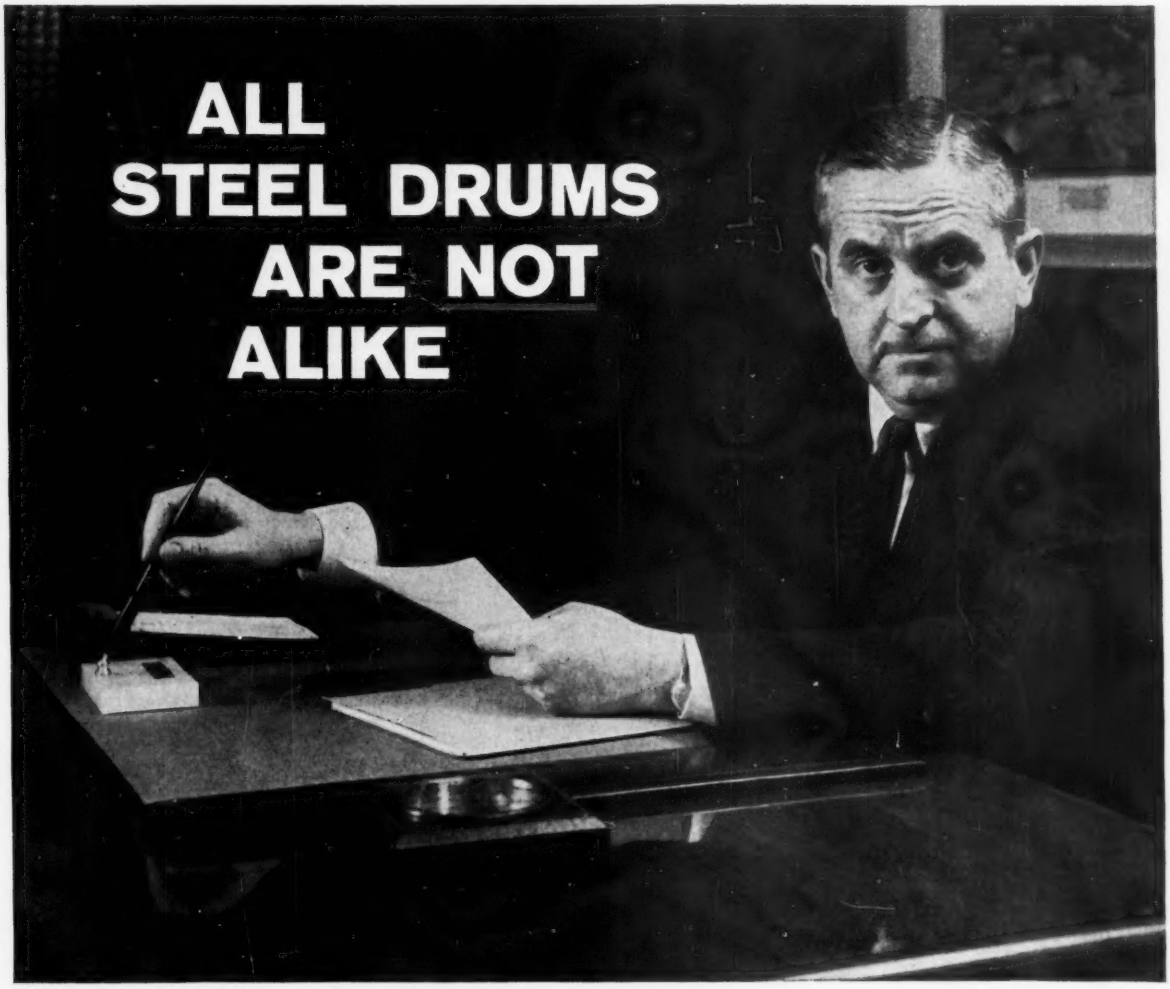
To compare the programing speed of Math-Matic with that of conventional coding, an expert at Remington Rand's automatic programing development department in Philadelphia ran a relatively simple trajectory problem by both methods. The new system required 10 minutes for writing eight sentences in pseudo code, plus 11 minutes for compiling a running program that contained 1,440 instructions. Time required to program the problem directly in conventional code: about two weeks.

The programing speed afforded by Math-Matic, says Remington Rand, pays off in a number of ways. For one thing, it enables users to get more for their computer dollars. The cost of computer installations or rental time makes it desirable to keep the machine as busy as possible. And, under the simplified coding system, it pays to feed many relatively short engineering calculations to the machine, instead of doing them by hand.

By the same token, the system's adaptibility to smaller problems frees engineers from routine calculating chores. And, by reducing the time it takes to get answers, Math-Matic reduces the time lag between collecting engineering data and putting it to use. Here's how these advantages are paying off for Carborundum Co. (Niagara Falls, N.Y.), a pioneer user of the new system.

Quality Control Aid: Carborundum has been using Math-Matic for about four months, primarily for statistical analysis of process data by engineers in the quality-control-research department. Supervising Engineer Richard Bingham reports that the system has increased the engineering utilization of the company's Univac computer.

The quality control group now has access to the computer only during scheduled periods of ½-1 hour, and occasionally during intervals of less than 10 minutes—between the machine's accounting and clerical computing schedules. Next year two hours per week of the computer's 24-



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hour-a-day schedule will be set aside for engineering use.

Although many engineers are, at first, reluctant to get involved in programing, says Bingham, they often become so fascinated with the new system that they prefer it to other engineering work. In Carborundum's 11-man quality-control group, one engineer is assigned the primary responsibility for programing; Bingham and two others also write programs in pseudo code.

The advantage of having a specialist in the department was shown recently, says Bingham, when the group's expert programer reduced the computing time of a problem from six minutes to 20 seconds simply by rearranging the position of one sentence in the pseudo-code.

Process Improvements: Savings made possible by the rapid analysis of process data were pegged in a recent Carborundum study of the correlation between product characteristics and process variables.

The problem: to determine the effect of variables, such as weight of raw materials and amount of reworked materials, on the composition and yield of refractories. Originally, the company planned to make the necessary studies in actual plant tests. Plant tests would have required about 15 man-days of labor.

Bingham's group decided that essentially the same information could be obtained from regression analysis of process data accumulated over a long period of previous production runs. Diagnosing the problem and stating it in pseudo code took about seven days. From there on the computer took over, required only 34 minutes to compile the final program, 5½ minutes to run off the calculation and 5 minutes to go through 11 regressions.

The time saved in getting accurate process-control data to the production group saved the company money, says Bingham, by preventing production of about $5,600 worth of substandard material.

One of the big advantages of a simple system for programing quality-control programs, says Bingham, is its value in enabling management to routinely appraise plant operations. Once a program has been compiled by Math-Matic, it's easily stored and readily available for frequent review of processes.

PROCESSES

Silicon and Boron Hydrides: A continuous electrolytic process for making various hydrides of silicon and boron has been developed at Goettingen University (Germany). The reaction is carried out in a double U-tube containing a molten mixture of lithium chloride, potassium chloride and lithium hydride. A chloride corresponding to the desired hydride (e.g., silicon tetrachloride, to get silane) is passed into the electrolyte along with hydrogen, which acts as a carrier gas. The hydrogen also serves to replenish the supply of hydride ion in the electrolyte by reacting with the lithium metal formed at the cathode. Yield is reported to be 97% in the case of silane. An excess of hydrogen—as well as complete absence of water, oxides or hydroxides—is said to insure the stability of the product. For instance, diborane with an excess of hydrogen is stable at the operating temperature of 359 C. Organically substituted hydrides, such as dimethyl silane, can also be made by the same method.

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Probing Corrosion: A new method for measuring corrosion in process equipment and pipe lines has been developed by Crest Instruments Co. (Santa Fe Springs, Calif.). Heart of the method: a two-part probe made of the same metal as the processing equipment. One part is exposed to the corrosive environment; the other, protected by a plastic or ceramic coating. The resistance of the exposed element increases as it corrodes. The resistance ratio between the two elements is a direct measure of corrosion, since both are at the same temperature. The new technique is said to detect as little as a millionth of an inch of corrosion, and provide a daily or hourly check of corrosion attack.

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Tungsten Carbide Purification: An Australian patent application (35,-518/58) assigned to General Electric Co. describes a method for reducing trace content of iron and manganese in tungsten carbide. The process: fusing a mixture of tungsten carbide with a pyrosulfate salt, extracting with water and washing the treated tungsten carbide consecutively with base, acid and water.

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November 22, 1958 • Chemical Week

Fertilizer Exports Slip Off Again

Value of U.S. fertilizer exports this year will likely decline some 7.5%, to approximately $125 million compared with '57's record high of $135 million. Five years ago, U.S. fertilizer exports were valued at about $42 million, a low for the decade. U.S. foreign aid to the Far East, increased world demand for plant nutrients, helped buoy U.S. overseas fertilizer shipments.

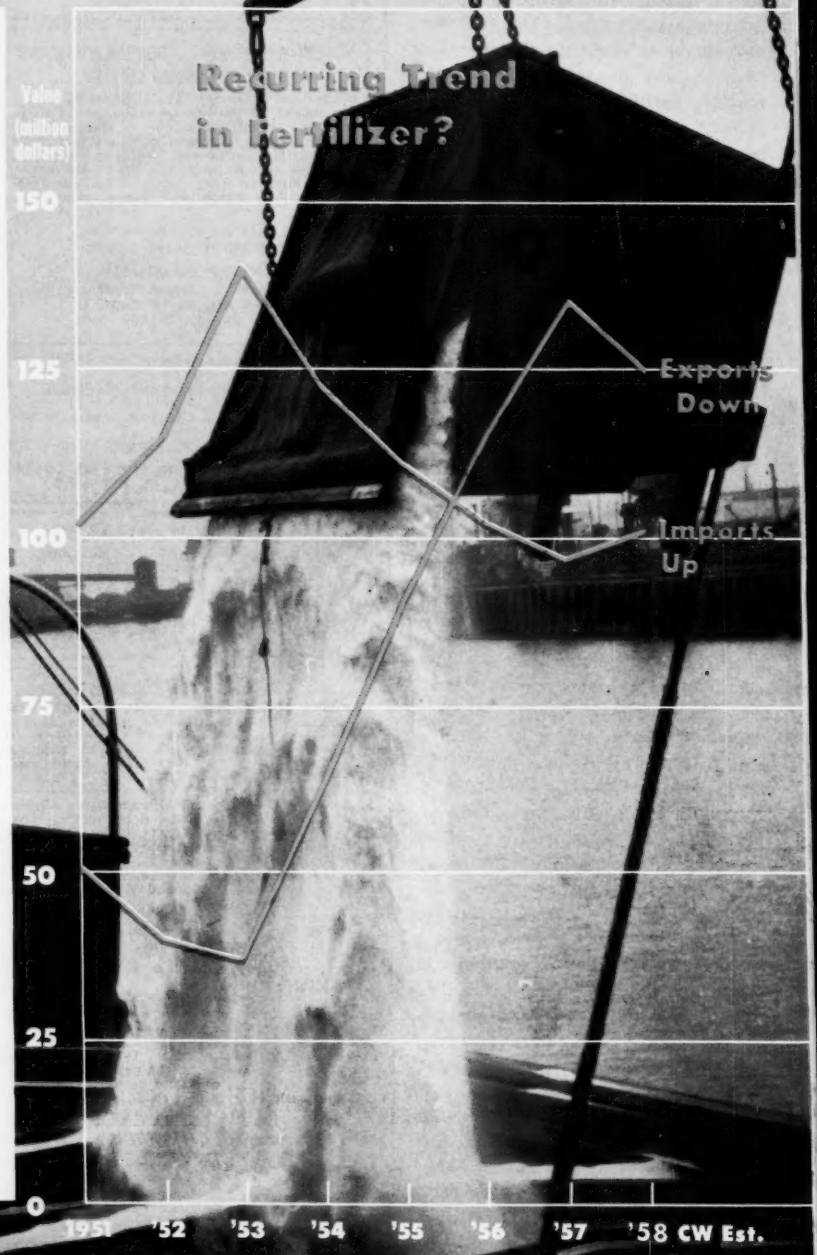
Reasons for the decline:

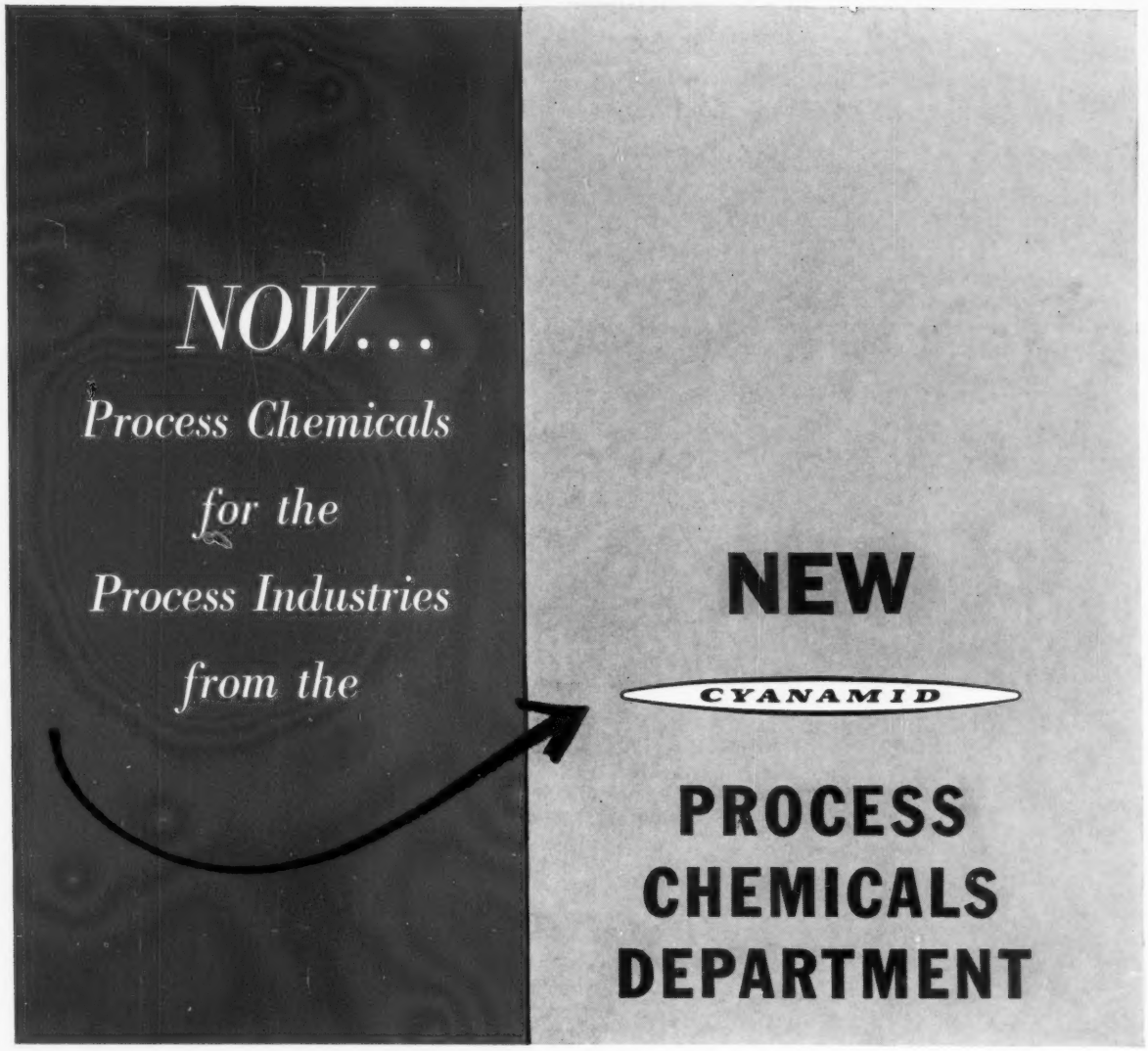
- Increased competition in world markets.
- Reduced availability of domestic ammonium sulfate, important export fertilizer.

Within the last several years, foreign nations have not only increased fertilizer output, but also produced enough plant nutrients to compete with the U.S. for overseas markets.

Last year some 39% of domestic ammonium sulfate was exported. But a sharp cutback in steel output resulted in a drop of coke-oven ammonium sulfate—and what was slated for overseas was used for domestic needs.

Despite the slight increase of fertilizer imports this year—some $101 million as compared with '57's $97 million—the industry feels that future imports will not rise appreciably.





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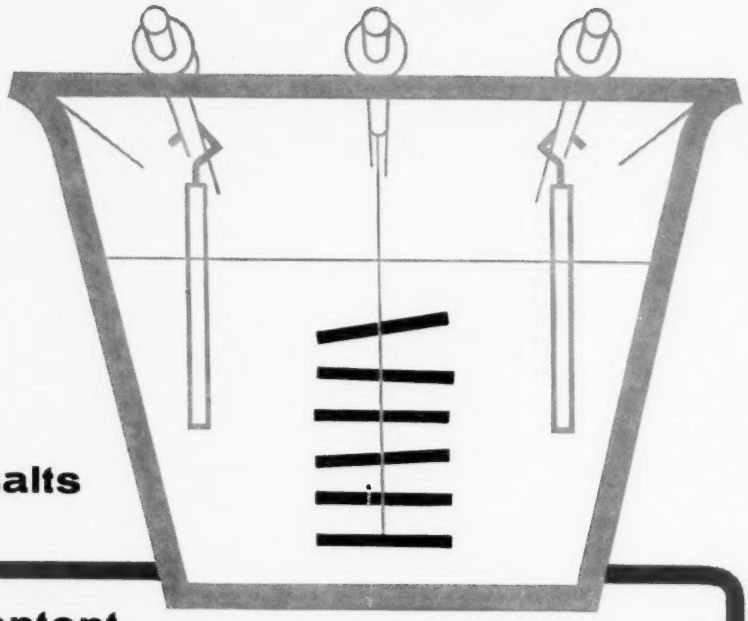

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